THOMPSON & SON
BROADSTAIRS
Name
No.

John Sowerby

Page
1
25 try these values on page 29 too
30
58
67
100
102
103
22

April 3rd 1802

Mixt as under 1 . 0 . 14 Nitri P P
4 . 2 . 0 Min
3 . 0 . 0 Sd
1 . 4 Ark
14 Antys

very good 9 . 0 . 4

Novr 13th 1802
Mixt as under for working into goods.

	qrs	lbs	ozs		
10½ lbs	3	0	0	Sand	
10½ "	3	0	0	Min	Lead
3½ "	1	0	14	Nitri	Nitre
2 ozs		1	0	Ark	arsenic
wo/ard 1½ ozs			10	Antys	antimony
25 /	7	1	24		

N.B. this worked rose colour, supposed from the Antys

Novr 20th 1802. for Enamellers

0 . 2 . 24		Nitri
1 . 3 . 24		Sand
2 . 3 . 24		Min
	24	Ark
	10	Antys
very good	6 . 0 . 3	

Novr 26th

Sand	4 . 0 . 0	
Min	3 . 2 . 14	
Nitri	3 . 7	
Pot Ash	2 . 14	
	9 . 0 . 7	

	lb
Ark	1
Borax	1
Anty	0 . 4
Mag	0 . 3

This worked very soft Ceres lead would have done say 28 lbs, not enough Mag by ½ oz. N.B. this pot Ash was very black but strong.

1803
April 23.

Mixt	O. L. S	Sand	
	V. O. –	Min	
	V. lo	Nitri	
	L. –	Ack	
	. lo	Antv	
	R. .		
Cullet about	O. .	.	

N.B. think 2 lbs less of Antv would do.

" 27 Mixt as under

6 " – " –	S	from Grenstead
4 " – " –	M	
2 " – " –	A	
2 –	N	
12 " 2 –	O	

N.B lead was part ⊕ and part MW Ashes fr Mr Norris

" 28 Mixt

4 " 0 " 0	Sand	
2 " 3 " 14	M	Lead
3 " 21	Ash	
3 " 21	S.P.	

⊕ lead & old Stoney Ash

filled into № 9
on taking it out it turned reddish or flesh colour, whether from the Iron on which the cakes were cast upon, or from what other cause cannot tell, but on remelting it became perfectly white, the enamellers also found it so to be consequently was no detriment.

Friday evening 11 o'clock filled as under

№ 2. Chestmetal & 8 oz colour
3. Small wash'g
8. do —— "
9. Chest M & Skim[gs] 8
10. do do "

N.B. too high colour, but all plain Monday morning & worked very well, except being Stoney

№ 4. Large & Small wash 6 oz colour with Mixture 28[th]
6 — do —— "

N.B worked still very stoney though the proport[n] of lead & Sand are greater than the preceding mixture. rather too high say ¼ oz less each.

5

1803
Apl 28. Mixt 2 . 0 . 0 S
1 . 1 . 21 M. M.W
2. 18 old Stoney Ashes
1 . 3 Nitre
lime ·2

Apl 29. filled into No 1. with 6 oz colour & large washed metal (too high coloured) worked very stoney suppose from Ashes (again) Nor do I find the lime of any benefit.

May 2nd. Mixt as under 12 . 0 . 0
(L) 8 . 0 . 0
3 . 2 . 0
1 . 2 . 0
25 . 0 . 0

N.B. Mixt the Ashes while hot from the kettle in order to prevent its going into hard lumps which these Ashes are peculiarly disposed to.

same days weighed 3 frit of mixs of 27 Apl. to which was added about ten pounds Nitre 2 lbs lime & 1 lb enamell in powder.

May 6. filled the otherside mixture into Pots as under

No 3	small wash & 4 oz colour		This metal was very stoney.
4	Large W & 6 "	"	
6	" —— do	-	
8	small do & chest 4 "	-	3-8-9-10 were too high coloured
9	" " " 9 "	"	
10	" " " 9 "	"	

This filled for an overtaker in No 1 pot, with 4 oz colour, which proved pretty good but stoney.

May 6. Mixt 2. 0. 0
mdo 1. 1. 21

2. 21 refined Nitre
1. 0 best pearl
2 Lime
2 powdered Wt Glass
½ tin
½ Calined Antys

4. 1. 19

May 6. Mixt as follows.

2. 0. 0
1. 1. 0 blue lead.
1. 0. 14 Christals of potash

4. 1. 14

May 9. Filled an overtaker small pot No 5 as above with the addition of a little Nitre

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May 10. Filled No 9 for an overtaker with cullet 5 oz Colr 5 oz Antys, worked (No crude

May 6. Friday evenq filled into No 1 with 4oz Colour.
N.B. fine on Monday mornq, but worked very cordy & Stoney, suppose in this instance, the Stones must proceed from Sand & not the Salts.

This mixture filled into No 2, with small siftings of Cheetmetal & 8oz Colour, but was too little by 4oz. Was obliged to ladle it out supposing it would not fine to neutrality of the Salts of which a large quantity floated on Surface of melted glass —

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a small quantity of frit made with mutual Salts & blue cullet. 3 lbs Zaffer ½ lb mag.

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the frit mixed 2nd May & chest & small wacked very Stoney & brown Colour
Antimony will do

1803

May 12. Mixt 6.0.0
mw 4.0.0
2.0.0
3.0 Nitre

The same again 12 " 3 . 0

May 13. Mixt 2.2.0
1.1.21 [4]
3.15. Kents Vegetable alkali
5.0.8

Same day. Mixt 180
120
112 Soda from Kent
412 3.2.20

1803

May. 13. Friday evening

No. 1	Large wash	7/3	rather too high coloured.
2	Chestnetal	8 "	
3	small w	4 "	
8	" "	6 "	
9	Chest —	4 "	
10	" + Skim 8s	9 "	

No. 1 + 10. very stoney, I think for Sand again

May 13 - Friday filled into No. 4. with 8oz + large washed Cullet (too much colour by 1oz) was a long time getting fine, suppose not enough Salts

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" 13. Friday filled this into No 6 with 6oz Colour and large washed Cullet on the surface of the metal floated a quantity of semi-vitrified Sand, suppose from the Acid in the Soda, but when fine the metal was soft and the plaiment had for a long time

May 16. E. 10 filled Pot No 10 for an overtaker a small quantity of frit say one 45 lbs each 4 oz colour & 4 oz Alb.

17. M. Y. filled small Pot No 5 for a flue cullet. Good

" 20th Mixt 24.0.0
16.0.0 [E] & M.U.
8.2.4 Ashes from Boiler
2.2.0 Nitre part refined
51.0.4

" ib Mixt 2.2.0
1.2.21
3.16 Salt tartar fm Powers & Co
5.0.9

— ib —
180
120
112 Soda from Powers
412.3.2.20

Added on Saturday 10 lbs Petre found this not sufficient, ladled it out on Saturday evening, added 6 Chorel fulls of our Batch as mixt before to which added 4 lbs Sal Tartar Mare

with the metal ladled out of No 2 & tinpailful to each harbour of about P.P. too high.
overtaker day 2¾ Zaffer & 1½ Mag with

May 20. Friday evening filled as under
No 1 –
2 –
3 –
8 –
9 –
10 –

Friday evening filled into No 4 with large washed Metal & 6 oz colour
N.B. This never was plain too much colour.

Filled into No 6 with 6 oz & large wash, was not melted on Saturday morning, then proceeded as on the otherside.

May 24. Mixd 2.2.0
1.2.21 [E]
3.14 Ashes from Towers not refined
14 Nitre P. P.

5.0.21

Mixd 2.2.0
1.2.21 [E]
3.21 vegetable Alk from Kent
21 Nitre P. P.

May 24. Filled as under with frit mixture 20 lbs 2 ozs

No 1	Chestmetal	4 pails frit	Second filling		
2	do	"		"	
3	small W	"		"	
6	Large	"		"	
8	small	"		"	
10	Large	"		"	

May 24. Friday filled into No 9. 5oz colour with large & small wash, was good coloured when opened, but turned Shoppy toward the bottom, perhaps from Ashes not being refined

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Do filled into No 4. 4oz colour and large wash Shoppy when about 6 Inches out.

Chestnetal	2½	pails	each weighg	lbs 45	5oz colour	1½oz Ash	8oz Horn-flux
"	1½	"	-	"	6"	"	"
"	2	"	-	"	5"	"	"
small W & Ladle metal	2	"	-	"	5"	"	"
Chestmetal	2	"	-	"	5"	"	"
Large	2	"	-	"	6"	"	"

Rather better but still stoney & brown colour

1803 10

June 3. Mixt 12 . 0 . 0
[4] 8 . 0 . 0
4 . 0 . 0 boiling out of kettles on which allowed 1oz in a lb for water
1 . 2 . 0 Nitre
6 Ark

Besides 8 . 0 . 0 of Bin mixt 20 lb

June 10. Mixt 12 . 0 . 0 @ 2/ 1 . 4 . 0
[4] 8 . 0 . 14 34/6
4 . 3 . 0
1 . 0 . 0
@ 22/9

Mixt 252
168
168 Kents Station
580 about 4/6 pt Cwt. dear
@ 24/4

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10 each pail of frit weighs about 45 lbs. 2nd filling

June 4.		frit	5oz colour	
M. 6 first filling	5 colours	5 pails &	small waist Pot	No 1. 5 pails & chest mixt
No 2	6½ 0 5	4	siftings	2½ " Ohemys
3	5½	4½	S.W	4 " chest
4	5½	4	L.W	5½ " T. W
6	5	5	do	5 " do
8	5½	4	S.W	5 " chest
9	5	4½	S.W ladled	3 " "
10	5	4½	L.W.	3 " T. W

NB. Hatter too high Colour still Stoney

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10 lb filled as under

			Second filling	
No 1 first	5 colours	5 pails	6 pails & chest	
2	6½	4 "	2½	Skimmings of frit with 13
3	5½ "	5 "	6	chest
4	6 "	6 "	5½	L.W
8	6 "	4 "	6	Chest
9	5 "	4½ "	3	"

NB. Very blue suppose from Lead

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same time this filled into No 6
first 6 pails & L.W 5½. 2nd 6 pails & L.W

Blue & not so clear as that on
13th May.

June 17. Mixt 12.0.0 1.4.0
8.0.0½ [illegible]½ mw 13.16.0
4.3.0 Ashes 4.8.0
1.0.0 Nitre 2.10.0
6 Ark 4.0

25.3.6

weighed 8.0.0 out of Box. Mixt 20th May

N.B The above two Mixs make better glass than either seperate.

June 22. Dried 2 lbs of frit composed of 3 Cr. deficient 5oz or about 2½ oz to

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Mixt 3.0.0
2.2.0
1.0.0 Potash
6.2.0

		first fillings 8.9.			2nd filling
June 17.	No 1.	5oz.	5 pails	+ S.W.	6 pails + S.W
	2.	6½	4 "	+ siftings	2½ "
	3.	5½	4½ "	+ S.W	6 " chest
	4.	ib	6 "	S.W	6 " S.W
	6.	5	5 "	do	5 " do
	8.	6	6 "	S.W	6 " chest
	9.	5	4½ "	S.W	4 " S.W
	10.	Com. green	2 "	siftings	2 " siftings
	5.	blue	2 "		

No. 2 was rather high, but all were good coloured metal, I observe it necessary to proportion the frit with the Cullet. which certainly makes better glass

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Sand + 4.2.14 of boiling salts from copper each lb nearly 18 p.Ct

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June 24. filled No 5. small Pot Best green about 70 lbs of frit as on other side with green Cullet + 2½ C M } first
2. C Scales } second
same

N.B. This very stoney, but colour very good.

June 24. Mixt 12.0.0 Old Sand from E. Grunstead
8.2.0 ½. [H]
4.2.14 Salts from Boiler
1.0.21 Nitre refd
6 Ark

Mixt 4.2.0 New Sand from Bloden & Co
3.1.14 Half Lynn
1.3.0 Pit
1.14 Natron
½ Ark

St B. 14lb per Ct W. of minium more than common

" 24th 8.11. filled No 1 pot with an overtaker with Lw the rest Chest metal was not

July 1st 14.0.0
10.1.24 [H] & M. W
5.2.14 Alk
1.0.0 Nitre
1.0.0 Soda
¼ Ark

32.0.10

June 24. Filled No 1. 5oz
2 6½"
3 5"
8 5½"
9 5"

No 1 very stoney
3 not quite high enough
8 very good, but little Stoney.
9 rather too high

" 24. filled No 4. 4¼
6 4

the first above Mixt 3oz of col. one tub of fine, but very good colour.

July 1st filled		First filling		2nd filling	
	No 1	5oz.	& W. 6 pails	old Chest metal &	5 pails
	2	6½"	siftings 4 "	" " "	2 "
	3	5½"	Lw 5 "	present "	5 "
	4	4½"	Lw 6 "	Lw	4 "
	6	ib	— 6 "	Lw	4 "
	8	ib	Lw 6 "	Chest	4 "
	9	ib	Lw 5 "	Lw	5 "

No 1 & 2 very stoney & the others were very indiff. not having had a good furnace to flux it properly
No 2 & 9 rather too much colour.

1803

July 1st Filled No. 5 for best green. Blacks + 2½ C. M^ts this proved too light and rather 2¼ copped with green chest metal, on Sunday out and added 2½ C. M^ts + 2. C. C it in at last but not plain.

8th	Mixt	12.0.0		£1.4.0	
		8.2.0		14.13.3	34/6
		4.3.0	ash	11.17.6	50/
		1.0.14	Stone	2.16.0	
		6	Ark	4.0	
		26.1.20		30.14.9	53/3
	Mixt	2.2.0		5.0	
		1.3.0	tipton	3.10.0	
		3.0	Ash	1.17.6	
		2.0	Sdtraw	2.10.0	
		1	dark 4oz tin	1.0	
		5.2.0		8.3.6	nearly 30/.
	Culle	3.0.0			

about 2 pails of frit as on thereside, with blue, ladled a little out and added 4¼ C. M^ts + 3½ C. C morning was too light colour ladled a little all 9½ + 7¾ — was a middling colour

1803			first				second		
July 9.	filled	No. 2	siftings	+ 4	pails	6oz	skimings	12½	pails
		3	Chest	5	"	4½	" ladled		
		4	L.W	6	"	it	L.W	4	"
		6	—	it	"	it	L.W	4	"
		8	L.W	it	"	it	"	6	"
		9	—	5	"	4	"	5	"
a small pot		10	Chest	2	"	2	Chest	2	"

No 1 Common green

weight of Pot 4.0.0 { 5 Best do 2½ C. M^ts lbs } with green Chestmetal 2. C. C } and 2 pails frit

second filling { 5. C. M^ts 4. C. C } with Blacks + do.

This green was very good colour but stoney. No. 6. was of the last mixture and worked very indiff^t.

1803 (14)

July 15. Mixed 12. 0. 0
8. 2. 0
4. 3. 0 wet
1. 0. 0
6 Ark

26. 1. 6

Blanch 3. 0. 0
4. 2. 0
1. 0. 14 Nitre rough
1. 4 Ark
12 Arn^{ty}

9 " 0 " 2
Chalk 3. 0
9. 3. 2

Sand 3. 0. 0
2. 1. 0
1. 2. 0 Potash (wet)

6. 3. 0

1803 (14)

July 15. filled	No	1. 6oz	first pipkings & pails	second pipkings & Skimps & 5 pails
	2	4	chest do	chest 4 "
	3	4	SW do	SW 4 "
	4	4½	SW 6	SW 6 "
	6	ib	ib ib	ib ib
	8	ib	SW ib	SW Ladled ib
	10	2	ib 2½	— " —

No 9 filled with W^{t} Enamell & proved very good

	lbs	oz
Weight of enamell Cakes	892.	4
" waste	112	
	1004	

No 5

gross weight. No 5 filled for purple with the
4. 0. 0 mixture opposite

	first		second	
4 lb	Mag	Blacks	5 mag	blacks
8 -	B.a		4 B.a	

NB This turned out very stoney but colour was deep enough to make into goods.

1803 15

July 22. Mixt. 6.0.0 Sand
4.2.0 Lead
2.0.0 Natron Cstarde
1.2.0 Alk
3 Ark

this filled into No 4 & 6

1803 15

July 22. 8.10 filled

			first	second
filled out of Bin mixt for some time back 1st & 8th Instr	No 1	3½ oz -	S.W. & 6 pails	S.W. x 5 pails
	2	4½ -	Siftings 5 "	Siftings 2 "
	3	4 -	S.W. 5 "	Chest x 5 "
	8	4 -	S.W. 6 "	— 5 "
	9	3½ -	Chest. 5 "	— 2 "
Grit as mixed on other side	4.	4	L.W x 6 "	S.W x 8 "
	6.	4.	" x 6 "	" " 9 "

No 5 for purple 4 mag / 1 Cm / ½ Z } Pallet V2 | same again

NB This proved good keep to this —

10. Common green
No 4 & 6 Not very good wanted about ½oz more Colour

#2. very good.

1803 (16)

July 29th Mixt same as 15th

12. 0. 0
8. 2. 0
4. 3. 0
1. 0. 0
6 Ark

26. 1. 6

Mixt 6-0-0
4. 1. 0
2-0-0 Vegetable Alkali Kents
21 Nitre
3 Ark

12 " 1 " 24

1803 (16) second

July 29. E. 8 filled

No		oz.		
1	3½	Chest	6 pails	chest & 4 pails a trifle more colour
2	4½	Siftings	5 "	Siftings Skimps & 2 pails ib
3	4	Lav	5 "	Lav 5-
4	4	Lav	6 "	Lav 6.
6	4	"	6 "	~~Chest~~ Lav 4.
8	4	Lav.	6 "	" 5.
9	3½	Chest.	5 "	" 2 " little colour

Nos 1. 2 & 9 were filled with the last mixture, the first weight of Colour would have been suffic.t without the addition

~~Green~~

No 5. for best green 1oz 1/4 lg 2½ C. M } green chest
2 C. C } metal

4.0.3

2as 2. C. M }
1¾ C. C } do

N.B. This was a good bright Colour, not quite deep enough for hollowgoods. but it was such a colour as I like

No 10. Common Green

Aug 5. Mixt 12 - 0 · 0
8 . 2 - 0
4 · 3. 0
1. 0 .0
6

do 6. 0 . 0
4 . 1 . 0
1 . 3 . 4 Vegetable Alkali
1 . 14 Nitre
3 Ash

12 . 1 . 21

			first	second
Aug 5. filled	No. 1.	oz 12	Blacks & 4 pails	Blacks & 2 pails
	2	4½	offings " "	Okum 8? 2 "
	3	3½	Chest 6 "	Chest & 5 "
	4	lb	Lw lb "	Lw 6 "
	6	lb	Lw lb "	do 6 "
	8	lb	Chest lb "	Chest 6 "
	9	lb	do lb "	" 5 "

No 5 Blue. lb 2 Zaffer 1 Mag with blue Cullet 2 pails fill — ½ lb Z & ¼ Mag 1½ pails

No 10 Common Green
No. 1. 2 & 9 were filled from last mixing

N.B. No 6 was very high Colour suspect the blue Harbour was made use of & by that some more colour was introduced more than expected it was very stoney also.

1803. 18

Aug 10. Mixt. 12.0.0
8.0.0 Min
2.0 Ceruss
4.2.0 Ashes
1.0.0 Nitre
6 Ark

26.0.6

19th Mixt 12.0.0
8.1.0 Min
2.0 Ceruss
4.3.0 Ashes
1.0.0 Nitre
6 Ark

26.2.6

1803 Aug 13 18

				2nds
filled Sts	1	12 oz	Blacks & 4pls	Blacks & 2pls
	2	4½	Saftings ditto	Saftings 3 —
	3	3	Chest 5	Chest 5 —
	4	ditto	Sw 6	Sw 6 —
4.0.0	5	2oz 1 Mass	blue pellet	— 2 —
	6	3oz	Sw 6	Sw 5 —
	8	3..	Chest 6	Chest 6 —
	9	ditto	do 5	— 3 —
	10	Common green		

NB. This metal did not turn out good it was very stoney & rather too high.

19th E.Y. filled Sts 1. 12 oz Blacks & 4pls | Blacks & chest 2pails
2 2½ Chest 5.. | Chest & 4pails
3 ditto ~ ~ | " 4 "
4 ditto Sw. 6 | Sw. 6 ..
5 Com. green | Sw. 5 "
8 2½ Sw & 6 | Chest 6 ..
9 ditto Sw & 6 | " 4 ..
10 ditto Chest 5 | Sw. 2 ..
Sw 2

N.B. Stoney & was rather too high.

1803
Aug 26 Smith

12 . 0 . 0		6 . 0 . 0
8 . 2 . 0		4 . 1 . 0
4 . 3 . 0	ash	2 . 1 . 14
1 . 0 . 0	Nitre	2 . 0
	6 Ark	

19

1803 20

Oct. 28th Mixt for Blanch

3 · 0 · 0
4 · 2 · 0
1 · 0 · 14
1 · 4 Ark
12 Aw

9 · 0 · 2
Culled 3 · 22
9 · 3 · 24
frit left out 1 · 4
9 · 2 · 20

about 1 lb Aw to 28

Same day. 1 · 2 · 0 Sand 3.0
1 · 0 · 0 Co. Gs. by Phillips 1.15.0
1 · 0 Alkali from Kent 12.6
1 · 4 own Alkali 15.4
3 · 0 · 4 3.6.1
Culled 2 · 11
3 · 2 · 18
1 · 2 left out
3 · 1 · 16

NB · 3/4 lb Ark & 10z Mag.

1803 20

Oct. 29. filled into St. 9

The produce was 14 21 Cakes wt. 8 · 2 · 25
Chest. 2 · 14
9 · 1 · 11

The evaporation appears
about 5 p.c

1803 21

Dec. 16. Mixed 1.0.0 Petre
1.2.18 Soda
1.10 Alkali

3.0.0
4.2.0 lead
6.0.0 Sand

13.2.0

Dec. 23. 1.2.0 Sand
1.0.10 lead
2.0 Salts from Allen
4 Petre

3.0.14

Chest metals —

1804 Apl 14. 3.0.0
4.2.0
1.0.0 fricts refs
11 Alk
1.4 Ar
12 Ar

8.3.24

21

This mixture did not work well I think better our Alkali than Petre

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This proved low coloured owing to Iron being in the mineral Alkali it was good tempered metal but Cordy. I think from so much Cullet

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1804

b Mx 12. Mixd 150 ground flint from Staffs shire
100 " litharge
50 pearl ashes refs
12 refs Petre

312/100 pickes Chest metal ab! 10 sedan

N B. This proved very good metal indeed

Stov. b. 12 lb frit 3 oz Mag } a fine marroon
1 ½ C. M } or red purple #1

to 20 lbs frit 10 oz C. M } a deep yellow
3 " Mag } St. 3

the above taken out and to the remaing frit & what was taken out put in again with 6 oz Manganese which produces a red yellow as #2. Suppose if less C. M would have been more red.

Nov 9. 240 Sand
160 M
80 Cash
20 P.
2 Borax
½ Arsenic 2 oz Mag.

This was not very good not quite Salts enough to sand or else more lead.

1805
Jany 16. flint frit 1 lb } ½ oz C. C
" & Cullet 2 lb } ¼ C. M

when melted and fine, ogaared in ½ oz red Tartar & Carbonate of Chimney Soot in the proportion of three to one. Repeated this again & added a little borax to the two last Articles which were calcined together to which I added ½ oz fine pow.d glass it was a very deep red, Sufficient to cover with flint for illuminating Lamps.
red Tartar sulphur sealed
3 oz R. Y. 3 10 oz C. S.

1805.
Jan 19. 2 . 3 . 24 L.
1 . 3 . 24 S.
2 . 24 Nitre
24 Ars
10 Salts

W.t Cullet 3 . 0 . 0

Mar. 2. Nitre 18.0.0 Sd.
6.0.0 Ashes from Kettle less 8ℓ
2.1.21 Petre less 2ℓ
12.0.0 lead

NB. These Salts were collected from the pans called bottoms & I suspect contained a large proportion of Natral Salts & als a large portion of water, suppose these were the reasons of metal not being plain so soon.

1805 apl 10. 6.0.0 Sand
3.10 rough Nitr
1.3.18 Ash dry as Sugar
4.0.0 Ld. Nitr
6 Ar
4 Bx

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11 1/2 " 6.0.0
4.0.0 Ground by mess Mill Ly-Hgt
1.3.21 Ash
3.0 refd. Nitr
6 Ash
4 Box

I took about 1/4 of the Materials after having been well mixed to which I added 2lbs Arsnick & 2lb Borax and mixt all well, I put at bottom 2 1/2 oz of our Manga. the Cullet was some we had from Wilson the glass cutter & some retort cullet except last Harbour about 1/2 of which was used and which was chest metal.

This pot No 9 held about T. 3.0.0 and was plain on Monday morning. We began filling on Saturday morning at 11 o'clock which was 15 Hrs later than the other pots, none of which were plain on Monday morning.

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apl 13. filled No 1 with the mixture & Chest metal 2 1/2 oz Mag
2 " Ladled Blacks 2 — —
8 " Chestnutal 2 1/2 — —
9 " Skimmings 2 1/2 — —
for pan No 10 about 4 Ft filling 3 lb Mag & 12 oz Crocus
2 nd " 4 " " 1 lb "

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apl 13. filled 3 with mixture & Small wash 2 oz Mag
4 " " Large — dragged metal
6 " " — — " "

From the Handmaid to the Arts
Encyclopedia Britannia

Nov. 22nd 1804.

	lbs	
To make best flint Glass	120	Silex
	50	Min
	40	ref^{d} pearl ash
	20	nit
2.11.10	5 oz	Mag

If desired to be fluxed with less heat add 1 or 2 lbs Ark. which will be effectual

Another.	120 lbs		
	54 P.a		
	36 Min	6 oz Mag	
	12 Nitre		
	1 or 2 Ark		£2.5.6

another Cheaper	120		
	35 P.a		
	40 Min	4 oz Mag	
	13 Nit		
	6 Ark		

another take same proportion as last omitting the Ark & instead put 15 lbs common Salts—.

Cheapest 120
30 M
20 P.A
10 Nit^{rs}.
15 com^{n} S.
6 Ark

This must have a long time after melting to thro. off the milky appearance, but will look well if properly managed—

The Composition of Best German Crystal Glass

120
40 ref^{d} P.a
10 Nitre
8 oz Ark & 5 oz Mag.

A Cheaper 120 ground flints or Sand
46 P.A
4 Nitre
6 Ark & 5 oz. Mag.

Flint divisor 08.467 Cubic Inches
Phial —"— 10,178 in each

Best Composition for Plate Glass for Handmaid to the Arts.

60
25 P.a
15 N
½ Bo^{t} if it should be yellow Green
1oz Mag^{a} + 1oz Ark^{s}, previously nitrified with the same ground glass

A Cheaper

		four times	3 times
60		240	180
20	P.a	80	60
10	C. S	40	30
¼	Nit	28	21/6
2	Ark	8	6
1	Borax	4	3
		400	300

Crown or best Window Glass

60
30 P.a
15 S.P
1 Bos
½ Ark if wanted softer 1 lb more.
½ Ark

A Cheaper Crow Window Glass

60
25 P.a not purif^{d}
10 Com^{n} Sal
5 Nitru
2 Ark + 1½ Mag^{a}

Common Green Window Glass

60
30 P.a not purif^{d}
10 C S
2 Ark + 2oz Mag^{a}

Cheapest.

120
30 P.a
60 Wood ashes
20 C. Salt
5 Ark.

Best Trial green. 120. 50. P.a. 10 C.S. 5 Ark
5 oz Mang^{se}

Cheapest 120. 80 Wood ash. 30 pearl. 15 C.S. 5 Ark

Query. Will Borax added to Ark in equal quantity promote the purification of glass after Vitrification is over.

From Haudmaid to the Arts

Composition for Green Glass.

200 Wood ashes
100 Sand

00 170 W. A
100 Sd
50 Clinkers ground

Metallic Colourings.

for reds Gold Iron Copper Manganese & Antimony

Yellows Silver Iron Antimony Mang with Tartar

Purple All those which produce red & blue

Orange Antimony, and all those that will produce red & yellow

Mr Accums Compos.n for Flint Glass

120 parts of Silex
40 " P. Ash
35 Min
13 Nitre potash
25 Oxyg.d Manag.

Grens Composition

10 3 Quarts 1 lb
½ a Sal Tartar ½ "
3 drms Borax 6 oz
1½ " flint white 3 "
1 scruple Nitre ½ "

Mr Davey Day.

white Manga contains
20 parts in 100 of oxygen
red 26 " " " " "
Black 40 " " " " "

It is found in the Rubelite & Amethyst
Red Oxyg.d of Copper is found in Cornwall
Nickel " is green ——
Fibrous Basaltes — do —
" in Ireland
Rock Crystal in Scotland
Chut Stone in Derbyshire

Mr Davey. Alumine & Silex in equal quantities
from a perfect glass, excess of Alum
tends to harden glass.
" " Silex Iron & Manganese readily
unite when mixed with water &
form a hard Cement or Lute.
Carbonates of Potash mixt with Alum heated
to redness evaporates the acid & leaves a
perfect Alumine it is found in the
Oriental Gems.

Calx of Tin will take out purple
of Manganese as well as Arsenic

Growan or Cornish Stone

Copperas of Vitriol of Iron
Blue Vitriol or Vitriol of Copper

Chas. Wm Scheele

Decomposition of Mutral Salts by unslacked lime & Iron

Take unslacked Lime moisten it with a
solution of Com. Salt & place it in a Cellar & in a
fortnights time the surface will be covered with
Mineral Alkali which must be scraped off & leave
the remainder in cellar for a fortnight & then scrape again
Water must be poured on the remaining
mass well stirred & filtered, the Solution has
a strong taste of lime water on which as it
should be exposed to the open Air for a
few days to precipitate the lime —.
It is certain that fossil Alkali always precipitates
solutions of Iron & Lime therefore fixil alkalies more
readily combine with Acids than these
Substances.
(1st) It is well known that Arsenic, gypsum & Calx
of tin destroys the red colour in Manganese.

2nd. If Nitre be added to greenish Glass in fusion
the green colour disappears (manag. does the same).
Manganese is incapable of taking away the
colour of glass tinged by Calx of Iron

From the Handmaids to the Arts

123. The Calx of Iron has the same effect & property as Gypseum or Calx of Tin, the red colour of manganese must disappear. If only a little Nitre be added to yellowish glass it becomes a dark red.

140. Manganese roasted violently produces a better colour.

250. Mangnese for Colouring Glass should be well roasted or calcined in a hot furnace & then thoroughly langated

252. Dimentions of a furnace for pastes or Gems Mark out a Cylindrical building of one yard diam: & 12 Ins High leaving a hole in the centre 1 foot diam: with an opening in front 6in Broad & 4In High with an Iron Frame & door. Upon this building must be a strong Iron ring with bars let in, over the hole in centre and another ring or cylinder must be raised to the height of 8 Inches, above the bars at the height of 5 Inches above the bars a frame & door should be fixed for feeding the fire 6in High x 8 Inches broad with a strong latch across it.
When a large Area must be taken of 24 Inches diam and the brickwork

carried up for 10 Inches with 4 doors same as for feeding the fire, first in brickwork 12 Inches high & 8In wide, these doors should be placed opposite eachother and the two front ones should be placed so that the hole which feeds the fire should be in the centre and opposite the aperture for the smoke which should be 6 Inches broad & 3 Inches high the whole to be Arched over which may serve occasionly for a calear or Calcining furnace by making bricks to fit & fill up the Cavity in the middle. ——

Composition of best & hardest glass for receiving colours —

No 1 take 12 lbs Sand
¼ " P. Ashes
1 " Nitre
½ " borax

2

take 12 lbs Sand
¼ P. A
1 Nitre
½ borax
¼ oz Arsenic

From Handmaid to the Arts

Composition for Soft glass for receiving Colours

No 3 take 6 lbs sand
3 " minium
2 " pearl ashes
1 " Nitre

4 take 6 lbs sand
3 " minre
3 " P.A
1 " Nit
½ " borax & 3oz Arsenic

Red Colour 1 lb of the matter No. 1 or 2
3 Drms Calx Cassii
grind the glass & mix the powder with the
then fuse all together.

A Ruby.

Take 1 lbs of matter No 3 or 4
2 Drms of gold by tin

Another less expensive
take 8oz of matter 3 or 4
8 " " Glass of Antimony
1½ Drms of gold by tin.

Take Rubies & Encyclopedia
Crystal glass tinged purple
Aluminem. Calcareum, & fixed
Mineral of tine.
Sold yellow according
to Neri
1 part Red Tartar
1 " manganese
1 " Arsenic

Brittannia
with manganese & this add
less in small quantities & at

Garnet

Take 2 lb matter 1 or 2
2 " glass of Antimony
2 drms of Manganese.

Vinegar Garnet

Take 2 lb of 1 or 2
1 " glass of Antimony
½ oz. Calx of Iron

for a paste resembling the diamond

Take 6 lb Sand
4 " Lead
3 " P.A
2 " Nit
5 oz Arsenic
1 scruple manganese

Continue the fusion for some time on a/c of the Arsenic.

for a Black

Take 10 lbs of 1 or 2
1½ Zaffer
6 Drms Iron
6 " Manga

another
10 lbs
1 oz Zaffer
6 drms Mag
5 " Iron

Red Cornelion 2 lb of Composition of Hard glass
1 " Glass of Antimony
2 oz. Calx dried or scarlet ocher
1 Drm Manganese

White do 2 lb Compste of hard glass
2 Drms Yellow ocher
1 oz Calx Bones.

From the Naudmaid & the Arts.
Scarlet bakers or calcined Vitriol seems to be a colour for reds
To Calcine Antimony for enamels take one part of Antimony & 3 of S.P mixt & detonated in a red hot crucible for Tin take equal weights of Tin & S.P and pour all out when done while hot, & clean crucible when cold with hot water.

From Shaw 454

4 oz. Borax } make a glass
1. Sand } very soft indeed
suppose these varied

Mr Davey says Alumine & Silex in equal quantities form a perfect glass, excess of Alumine tends to harden it.

Silex Iron & Manganese readily unite and form a strong compound.

Silex Alumine Magnesia & Iron are principle ingredients in most Stones.

To try the specific gravity in waters, weigh the water which the stone or body displaces being the diversion of weight in Air when any Stone is 5 times heavier than water it is of the Metallic kind.

From Newman by Lewis Vol. 2nd page 13.
Chalk notably promotes the vitrification of flint a mixture of the 2 requires less Alkali than either seperate. hence Chalk is sometimes used for Glass when less salts may be used. A Mixture of Chalk with pure white Clay melt without any addition, they are with difficulty brot. to perfect transparency in covd vessels but if exposed to the Action of the fire in contact with the burning fuel, they vitrify with ease, the addition of Sand promotes the Vitrification. Mr. Pott has given some interesting experiments of Chalk on the Stones.

Chalk vetrifies with Alkalies rather difficultly, but with Borax rather easier than flint & and about its own weight of Alkali & of Borax half its weight
" Sandiver with half its weight of Chalk forms a greenish glass, its requires its own weight of alkali. Nitro does not vitrie with Chalk.

page 42. Equal parts of Talc & Chalk with one fourth of Borax melt into a transparent green glass. Talc with ½ its Wt. of Sand & Nitre give a topaz glass

Orschal. in a treatie entitled Sal Sine Vesta says the muddy matter obtained in polishing of gold with colour glass equal to the precipitate of tin.

The Frommel operater to Kunchel says, if white venice glass in which a portion of Manganese was used be rendered into powder and melted with one fourth or one eighth of Nitre it will acquire the true ruby colour or by Salamoniac & brown powder from Gold by Aquaregia precipitated by first Alkaline solutions.

see also April 1808

Mr Davey says Carbonate of Potash mixed with Alum decomposes & when heated to redness evaporates the Acid - it is found in the Oriental Gems.

From the Repository of Arts &c.

To make spanish red take C. M. dilute with water & boil it in an Iron boiler, after standing five minutes pour the liquor off or convey it into a pan or reservoir when settled decant the liquor and dry the matter then put it into a reverberatory furnace where a bright flame conveyed over it, for eight hours the colour is changed from a yellow to a bright red when cool the matter must be ground in a mill with water and received into sieves whence into Cisterns or vessels which communicate to each other by spouts say six or less after standing 24 hours the water must be drawn from the colour and then mixt with Alebaster & Chalk finely powdered, after which it must be dried in earthen dishes or pans about 10 Inches wide & 4" deep -

To make a mineral white take one of blende black Jack or Lapiscalaminaris, first calcined then powdered & mixt with an eight part of it weight of charcoal in powder, then put into a Jar or pot with a pipe in its bottom communicating with a reservoir below the bottom of furnace or placed in a glass house furnace the Jar & reservoir being luted & exposed to a strong fire for 5 hours the metallic part- or Zink will be collected in the reservoir. The Zink immersed in vinegar & exposed to a gentle heat for 12 days then it will be dissolved and a white powder will fall down which must be collected & dryed after which it must be mixt with a 10th part of its weight of Sulphur & Sublimed, then ground & conveyed into Cesterns & dried as before.

Memo.

Repalory of Arts Vol 3. 1803 page 89
Edwd Stephens furnace for burning lime &c &c

Storlons patent for improved water Mills 329.

Mr Ferry city Road a mill for grinding hard substances.

folio 161. for preparing fossil Mur. Alkali.
Vol 1st 1802 page 121. Phosphate of Iron with Manganese
13 page 124. for Red enamell.
take 1. 2 or 2½ parts sulphate of Iron & one part sulphate Alumine fuse them together in their water of Christalization mixing them carefully & well expose them to heat till are perfectly dried then increase the heat till quite fluid in a reverbertary furnace till it obtains a red colour * If Alum alone is used with Sulphate of Iron, it will succeed very well, which may be varied according as colour is required, the more alum the paler the colours, 3 parts of Alum with one of Sulphate of Iron affords nearly a flesh colour, alum renders this colour fixed under considerable intensity of heat. Vol. 11. page 335. On the decompost. of Com. Salt by Oxg. of lead. take one part of Com. Salt to six or 4 parts of minium mixt with water to a paste adding water to keep it so till are well incorporated, then wash & filter

* in order to make the red colour deep & fine, it is necessary to expg. of Iron alone or with various proportions of Alum in order to complay alum alone or sulphate of Iron — hinder it from giving out its oxg. & losing its water of Christalization

take one of blende
naris, first calcined
an eight part of
der, then put into
in its bottom
rvoir below the bottom
lass house furnace
ted & exposed to
he metallic part-
d in the reservoir
gar & exposed to
then it will be
powder will fall
cted & dry'd after
a 10th part of its
d, then ground
duced as before.

3-1803 page 89
for burning lime

oved water

Mr Terry city
hard substa
folio 161. for
Vol 1st 1802 pag
13 page 124. for
take 1. 2 or 2½ p
sulphate Alum
water of Christa
& well expose
dried then re
ted in a reverb
obtains a red
used with Lu
succeed very
according as
more alum the
of Alum with o
nearly a flesh
colour fixed
of heat. Vol. 11.
of Com. Salt by
of Com. Salt to
with water to
so till are suc

* in order to make the red colour of oxyd of iron stand the fire, & hinder it from giving out its oxyg & being reduced to a black oxyd, employ alum alone or in various proportions of alum with sulphate of iron —

Zink & Arsenic are violatile therefore must be
sublimed in a Retort.
Calcined Boras & Rosin will flux fluor
Spar &c
Oxydate Copper with Nitric acid add a solut.
of Alkali to deposit the Oxy.
Oxydate Iron by Muriatic acid & Caustic potash
Succinic Ammonia will precipitate Iron
The above from Mr Daveys lecture
Boil Antimony in Muriatic acid & water
& precipitate the solution & you will have a
white powder.
The succinate of Amonia will precipitate
Iron from Manganese
If in Zink & Lead fused together eats
into combustion & after they have continued
as long as may be judged proper, drop
into the crucible some powdered
Charcoal and it will cease.

Oxy. of Bismuth is a very white
powder called flake white.

From the repertory of Arts Vol 13 page 129
Oxy. of copper as a red colouring matter is
somewhat inconvenient, but it is used with
success in tinging of glass of a beautiful red
colour of various shades in this process not pure oxy. of Copper
but a mixture of that with Iron. the Iron must not
be thoroughly oxydated, a very little Calx of copper is
to be put into the glass to be tinged & which must
be of a faint yellowish green hue. and it must
be made red by mixing with it some portion
of red hort tartar & soot. This matter must
in the glass makes it a very deep colour
on receiving this addition the glass swells
considerably, it must be left to stand a little before
using and watched least the colour should change
which it will quickly do and is even apt to
change by using but reverses when heated over
a flame. It is exceedingly difficult to make a
very good preparation of this colour.
Calx of copper alone if properly manages
according to the process herein mentioned
affords a beautiful Carmine red and the
Calx of Iron added in suffic. quantity
changes into Vermil.
Calx of Copper melts Alumine easier than Silici

and so does oxy^{d} of Iron by fusing two or three parts of Alumine with one part of Oxy^{d} Copper under suffic^{t} strength of fire we obtain a very opake enamell of a vermillion red colour. Calx of Iron fused with Alumine in the proportion of above affords a beautiful black. 2 Alum 1 Iron.

Self. Vary these propor^{ns} & buy Sulphate of Iron with Alumine and a little Nitre

Vol. 13 page 115 – to prepare materials for Enamell fo. 15. 20. 30 & 46 parts of tin to 100 parts of lead in a red heat the mixture burns like Charcoal and is quickly calcined, but it is most readily so in the proportions of 20 to 25 parts of tin to 100 of lead, but if in the first process, it should not be perfectly calcined it must be returned to the fire again & you may know when ceasing to give out Sparks if the tin exceed 30 p.C greater intensity of heat is required to Calcine it.

The proportions for enamell is 100 parts Calc^{d} tin & lead 100 parts of Sand 25 or 30 parts muriate of Soda the inferior parts are seldom Br^{t} into perfect fusion it nevertheless becomes suffic^{y} white upon being broke in peices and again baked in the furnace, this is the common process for the preparations of W^{t} Enamell in the Pottery works of France. for Porcelaine the proportion of 25 to 100 is never exceeded but for common earthenware. 15 to 100.

If is easy to see that to obtain a white & more fusible enamell we must use less sand & not more salts for the Whiteness & opacity depend on the quantity of tin Calcined mixtures should be used in an increased degree oxy 100 parts of Lead & Tin to 60 Sand & 25 Salt.

But it is to be observed that some further manipulations are necessary for the best preparations of Enamel to be laid on Metals. The Sand for this must be previously Calc^{d} with about ¼ its W^{t} of Com. Salt either in a crucible or in the great way in the Porc^{n} furnace.

If a very fusible enamel be wanted then minium must be added nearly in equal proportions with the Salts which must be used in same proportions as first mention^{d} process or 50 parts of Sand to 100 Lead & Tin. ——

A flux for enamel which Answers for Reds
60 parts of Sand or less 30 Alum 35 Sea
Salts 100 Minium

Lime renders Glass less brittle but it ought in no case to exceed the twentieth part of the Silicia otherways it corrodes the Pots. 6lb to every Cwt.

To purify Potash, take one part of Ash to two parts of Lime in ten parts of water let it boil for sometime then strain off the liquor and let it stand, then boil up the liquor to the Consistency of Glue.

1805. April 5th

Mixt 6 . 0 . 0
4 . 0 . 0
1 . 3 . 14
2 - 0
4 Ark

---

same day

6 . 0 . 0
4 . 0 . 0
1 . 3 . 7
2 . 0
6 Box
6 Ark.

1805. Apl 10th 6 . 0 . 0
3 . 10 R. Nitre
1 . 3 . 18 Alkali dry as sugar
4 . 0 . 0 m. w. Lead
6 Ark
4 Box

about 2½ Colour in each pot

12 . 3 . 10 NB. This worked well but Stony

---

same day. 6 . 0 . 0
4 . 0 . 0 ground Lyk by cwn Mill
1 . 3 . 21 Alk Li
3 . 0 ref. Nitre
6 Ark
4 Box

about 2½ Colour to each pot.

12 . 3 . 3 NB. This was better than the above.

Apl 19 - Mixt 13 . 2 . 0
8 . 1 . 14 Lead
4 . 3 . 0 Ash wet
1 . 0 . 0 p. Nit
13 box
13 Ark.

26 . 3 . 12 This proved Stony, tho was very good colour same as above.

1805. Mar. 8th Mixt 3. 0. 0 Sd
4. 3. 14 bottoms & Slush
3. 2. 0 Lead refuse
1. 0 Pet
1 Mang.

11. 2. 15

NB This serves for coloured glass as well as the best frit.

April 26th Mixt. 6. 0. 0
4. 0. 0 Lyth. Sd in oven mixed
1. 3. 21 Ash x ct very dry
3. Optr — — —
6 Ars
6 Box
12. 3. 5

Same day. Blanch 3. 3. 0
5. 2. 14
1. 1. 14 Rough Nitre
15. 15. 0 Crude Ars
0. 4 oz. C. M
11. 1. 1

NB. This was very good. T.G.

Apl. 26. Felled

No	2	wch Blacks	mas 6oz + 2lb Ark.
Good	3	small w	2¼ + batch on other side
"	4	Large " full	2½ —
	6	" bau	2½ —
	8	Chestnetal	2½
	10	about 3/2 C.M	+ 1½ + Chestnetal

The first Larbour was made up of all the Chestnetal & a small quantity of frit and when well melted ladled out & when 3/4 full added a moderate quantity of the ladled metal & frit which kept it from fermenting to excess

May 2nd Mixt 12-0-0
8-0-0
4-0-0 ash
1-3-0 rough Nibs
1/2 Box
1/2 Ark.

25-3-24

NB. I suspect the Ash is not very good.

May. 3rd 1. 1. 10 Sc. flints by oxon horse mill
3. 16 " Lilharge
1. 22 Ashes
1/2 Petre
2 box
2 Ark.

May. 10. Mixt 12-0-0
8-0-0
3-3-2 Ash
1-2-0 refs Petre wet
10 box.
12 Ark

Same day. 1. 1. 10 Sd Lead Granules
3. 16 Ly/L Erase
1. 20 Ash
10 Petre
2 Ark
1 Box

May. 4. filled
No 1. Chestmetal 4 1/2 1/2 oz. colour & more added
all too low 2. Blacks 6 " & 1/2 of Ark
except 3. S. Wast 2 1/2 " & ground fit fruit
No 6. 4. LW " 2 3/4 "
6 " full 2 1/2 "
8 Chestmetal 2 3/4
9 Smalloosh. 2 1/2 oz. & 28 lbs of S? enamel no advantage

No 5
Stone wt. 3-2-0 Best green. 9 1/2 C.m 6 1/2 O. Scales
N.B. too much C.M by one lb.

do Blue for an overtaker 2 lb. Zaffre
1 " Mag } twice

May. 10. filled No 1. Chestmetal & 3 1/2 colour added 1/2 oz.
2. Blacks 8 " & 2 lb of Ark 2 "
3 LW 2 3/4 " —— 1/2 "
4 LW 3 " —— 1/2 "
6 " " 3 " —— 1/2 "
8 Chestmetal 3 1/2 & Esher frit more
9 LW 2 3/4 —— one

From Naudmaid & the Arts, May 1805

Take of Compos. No 1 & 2.

Glass of Antimony	2 lb
Scarlet oker	1 ~
Mang.e	2 oz
	1 drm

fuse the glass of Antim.y & Mang.e with the other glass first together & then powder them well & mix with the Scarlet oker by grinding & then fuse the mixture with a gentle heat, but not cont.e longer than necessary; if desired to be more & transparent less oker must be used.

May. 10. Try 1 lb of glass &c. 2 oz copper, 2 C.M, 2 borax, 2 Lead } too soft & yellow

Try 1 lb of flint frit 2 oz. Copper
2 ~ Iron
2 ~ Alumini
2 borax

This was a brown red.

May 1805

Tried 1 lb frit
1 ~ &c. glass
8 oz. glass of Antimony
3/4 ~ C. M
3/4 ~ Copper. This produced a good yellow.

From the Polographic dictionary for a carbuncle colour 6 lb of frit 1½ oz. Copper mixt well. two hours after is cast in at three intervals ½ C. M & three hours after 6 oz. Tartar Calc.d, Chimney soot vitrif.d 1 oz. C. M. again 1½ oz all well mixt and cast in at four times, stirring the metal well each time.

1805. June.

Mixt some frit with Caput Mortuum of pearl Ashes & 3½ lb Copper
3 ~ C. M

which produced a very good red glass.

July 5th Mixd 6.0.0
4.0.0
2.0.0 pretty dry
2.14 refo Sit
.6 Ark

12.2.20
Repeated 12.2.20

25.1.12

Took about 8 & added 12 lbs borax
*intended for two pots say No. 4 & 6

July 12th

No 1. 3 2/3 oz. Chartreuse Yellow as on the other side
2. 4 " " " " "
3. 2 3/4 " " " " "
* 4. 3 oz. new mg. 2 oz. Yellow
* 6. 3. " "
8. 3 1/2. " Chartreuse
9. 2 3/4. " Lilac

Blue 5. 1 1/2 oz Mag. 1/2 oz Baffer with Blue
Cullet respected " this. " with " " "
a little Blue & this made from
bottoms.

Green 10. 3 1/2 oz. 3 1/2 oz. m with Yellow
" 3 1/2. - 3 1/2 _____
" 1 - 1 _____

Yellow 10 mixed

Yellow 10 mixed

Green 10 mixed

47

for Black 13th July 1805

Groes w.t of Pot. 3.1.0

first filling 1 flint frit 4lb c.m 5.4 Mag
4 lb of red lead

rather too much Mag. Ladled it out.

next filling 1 - frit
14lbs red lead
1.1.0 refuse } 18lb — 11 —

thought this not deep enough, ladled & returned with.

added. — 2½.0 frit 9lbs — 6.0 —

I think this not deep enough.

3.3.0 34 22.4

A fine Amber. see sample A

---

1 lb frit } 1½ oz. Iron scales
1 " glass } ½ - mag } perfectly black as sample B
½ - Z

---

2 lb ground glass 2 oz. mag
1 - flings } black as sample C
½ - Z

2 lb. δ° " 1 oz mag
1 - c.m } blackas D
½ flings

2 lb — 3 oz 2 mag. 1 flings } rather yellow sample E

3lb flint frit } 9 oz Mag
3 - δ° glass } 4½ - flings } a good black F
2. Box

Ladled this out rel.° . .. F½

2 lb glass } 5½ Mag 1½ oz flings
1 " frit }

Try 2 lb frit + glass ½ oz Copr ½ oz c. m ½ oz Alum

Remark Amber.

July 19th No 1. 8oz with Liftings
2. 3¼ " Chest
×3. 2¾ " SW
×4. 3¼ " LW
×6. 3½ " " "
8 3½ " Ched
9. Enamel very good

6.0.0
4.0.0
2.0.0
2.14
×12.2.14
−14 Box
too much — Mark

1805.

July 26. Mixt. 12.0.0
7.0.0
4.1.9 Rd
1.2. 9 St. Ref.
15 Box
12 Ark
Mag 12oz.

Mixt. 1. 1.10
1.22 R.L
1.22 L.L
14. Ref. N
4 Box
4 Ark
Mag 10z.

July 26. No 1. 6oz. + Blacks + a little more
2. 1¼ " + Chest
3. ¼ " + fit 2 Harbours
4 ¼ " " "
6 ¼ " " "
8 1½ " " " + a little more
9. 4 " Liftings more
10 Common Green

No 3. 4. 6. Ladled out + rel. with LW. ½ oz each
Mag. worked rather sloppy too much
Ark.

No 5. A small Portful ½ oz. Mag + Chest
second filling small wash
Very Good.

Aug. 2. Mixed 6.0.0
4.0.0
2-0-0
2.14 ref. S
6 Ark
6 oz. mag

---

same day. 6.0.0
3.2.0
2-0-0
2.14 ref. Mit
6 Ark
6 oz. mag

filled Pot. No 3. 4 5 6 } as on other side

---

aug. 6. 6-0-0
4-0-0
2-0-0
2.14
4 ark
6 oz. mag

This repeated.

Filled Aug 2. with the mixture as on other side. Pot. 2. 1¼ + Chestmetal
8. 1½ + " "
9. 4 + Blacks
10. Blue. 2 lb mag + 1 gall. water will blue sweet
second filling repeated.

Pot No 3. ¾ oz + Lw. second flg. a little more clear
4. ¾ " Lw. " " " " "
5. small Pot. ½ oz.
6. ¾ oz. + Lw. " " " " "

NB. Filled one harbour of large washed metal into No 5 next morning ladled it out and then filled again with frit as on other side + colour as above and proved very good.

---

aug. 9th. filled No 1. 1½ oz. + Chest metal
2. 1¼ " " "
3. ¾ " Lw.
4. 1 " Lw with rel. Lm
6. ¾ " Lw " " "
8. 1½ " Chest metal
9. 4 oz blacks

NB. Friday evening filled No 4 + 6 with L. W. wallet + next morning ladled it out into water + rel. with a proper proportion of frit.

Aug. 9. 0. 3. 9 g^{s} plumbo
2. 0 — Lyth
18 Ash
18 oz. Nitre
¼ Box
½ oz. mag

filled into 5 Pot.

Repertory of Arts. Vol 9. Page 283
To separate fossil Alkali from
Com. Salts take 20lbs com Salt to 20lbs water
25 ~ Dry Potash

The licivium to be evaporated by boiling till pellicles rise & fall two or three times, then set to cool till milk warm & then strained and the liq. set to cool.

Repertory Vol. 6. page 83.
A substitute for W^t or Red Lead. viz. Lead Ore ground.
Vol. 4 page. 281. Improve brewing Ale.
2 " 36 Description of a furnace for drying Salts
" " 148. Making Pearl Ashes.

Aug 9. filled N^o 5 a small Pot 3. 2. 0
½ oz. Mag. 2 pails fr it & best picked metal
—— next 4 pails & " " "

To Calcine Tin

½ lb Nitre melted in a crucible, throw in gradually 10 oz of tin filings, a spoonful at a time, stirring it with a tobacco pipe.

To Calcine Antimony

5. Nitre three parts } which detonate
Antimony one " }
when all is in let it remain quiet for some time

Handmaid to the Arts. Vol. II page 282

If a glass should be too high in order to change the colour take 4 or 6 oz. Ark. & 2 or 3 oz of calcined Borax tie them in strong brown paper and after to an Iron rod and plunge them to the bottom of the pot.

If too low coloured do the same with the addition of a little mag. very finely powdered only if yellow or greenish put one or two pounds of Nitre mixed with ground glass perfectly dry.

1805 54

Nov. 20th

6 - 0 - 0
3 . 2 . 0 G.L
2 - 0 . 0 Alkal
2 - 0 ref.N
3½ box
4 Ar.
3oz mag

12 - 0 - 4

22d

4 . 2 - 0
1 . 3 . 0 New Lead mw
1 . 2 - 0 Alkali
1 . 14 R. St
3 B
3 Ark
2½oz Mag

NB. This Lead is very good.

I think not Salts enough.

54

filled No 3 . L.W. ½oz Mag with fit as on other side
4 L.W. ½ - fuller
6. one Larboard / L.W. the rest bedded } ½oz bare

N.B. Very good Coloured but rather stoney suppose from Alkali the last Emerica

Fill with Frit as on other side
No 1 - S. W. chest cullet ½oz Mag } good colour
2. " " " ½ " " } but Stoney

1st filling No 5 for Blue about 4 Gross.
2lb Mang. } with blue cullet.
1 - Zaffer }

2do - 3lb Mang. }
1½ - Zaff } with Blacks & Siftings

N.B. This was good blue glass
Keep to this.

Nov. 24. 1805.

6. 0. 0
4. 0. 0
2 - 0. 0
2 - 0
4 Bo
4 ar
3oz Mag

- 29. 12 - 0. 0
4. 0. 0 alkali

---

16. 0. 0 Clay & Ground

put thro' pot sieve with 4. 2. 0 Mix Lead
1. 0. 0 ground Nitre
6 Bo
6 ark
6oz

---

24. 2. 12. 6

No 9. 4oz Magna & blacks

No 1. ½oz Magna & Chest
2. ½ ~ hungbare & ~
3. ½ ~ ~ ~ S. W
4. ½ ~ full. Lacided Metal
6. ½ ~ ~ ~ ~ ~
8. ½ ~ & Chest & S. W

The above was too high coloured and very stoney which I suppose from the America pearl ashes:

Dec. 3rd 6 . 0 . 0
2 - 0 . 0 Russia Ashes
2 . 0 Ref.d Nitre ground

8 . 2 - 0

Well mixed & remain till friday then added
4 . 0 . 0 Mix. Lead
4 Bor
4 Ark
3oz Mag

Mixt again 6 . 0 . 0
3 . 3 . 0 Mix
2 . 0 . 0 Russia
2 . 10 Ref.d Nitre
8 Bor
6 Ark
3oz

N.B. This was mixed same as above I think both these mixtures would have answered better if more Salts had been used. what was used were very wet Consequently an allowance was necessary See 5th July 1804 26 - Aug 2 . 6 .

fills No 1. 1/4 oz Mag 2 pails in each harbour with Chestmetal
2 . 1/4 very bare weight &c - - - - - - - -
rather too high 8 . 1/4 full weight - - - - - - -
9 . 8 oz - - & - - - - - - with block

---

fills No 3. 1/4 oz & S. W - 2 pails frit in each harbour.
very good working metal but rather too high { 4 . 1/4 . full weight Lead & Lead mixed 2 pails
6 . 1/4 - - - - - - - - - - - - - - - -

small 3 . 2 . 0 Pot. No 10. about 1 . 1 . 0 frit mixed 4 lb calcined tin and Chestmetal no colour, but what was next will be frit which proved very good.

1805 57

Decr 10th Mixd 6. 0. 0
4. 0. 0.
2. 1. 4
2. 0
12. 3. 4

Dec. 12. 6. 0. 0
3. 3. 0
Mixt more each 2 — 1 — 0
2 — 0
12
4
2 oz
12. 2. 16. 2

Dec. 13. 3. 0. 0
1. 3. 4 ung.t Litharge
1. 0. 14 dash.
1. 0 resp. Nitri
6 Box
2 ar
10 oz
6. 1. 1. 1

57

No 1. 3/4 oz two pails fill in each harbour & Chestmetal
second filling same

2. 3/4 base w.t & ditto
8. 3/4 full w.t & ditto
9. 8 oz & Blacks
5. first filling 2. Man. 10 oz Jaffers with blue Reeds
second " 3 " 1½ " " flint as stirrings & black.
too much colour too deep. 2 & 1 wanted
have done.

3. ⅛ oz Man. 2½ pails fit with S. W
second filling — ditto —
4. ⅛ oz L. W & ladled metal second
second & third filling L. W
6. ⅛ oz — — ditto — —

This mixture was dried in the Calcar and ground (by Keen) in our horse Mill & passed thro' sand Sieve.
It was filled into No 4 with L. W Cullet, it would have taken ⅛ oz more colour worked very stoney & rather cordy Jan.y 1806. first week —

Dec. 13. ½ lb Trimplings
½ ~ Antimony } Calcᵈ
½ ~ Sulphʳ

do. 2 lbs materials
½ oz C. M. ~
½ ~ Copper } this was black with streaks of red
2 oz Crude Tartar

— 28. 40 oz Sand
4 ~ Lead } very hard colour as per sample
6 ~ Petre
8 ~ Scoria Tipton } from Iron foundry

Memorandum from Chambers Dictionary at Mr Hashmores Attys to Glass sellers Compʸ Compoˢⁱᵗⁱᵒⁿ for fluit Glass.

120 Sand
50 Lead
40 Ash
20 Nitri
5 oz Mag

another
120.
54 Ash
36 Lead
12 Nitri

for Red Glass see Shaws Lectures.

These are same as Handmaid to the Arts Nov. 22. 1804 see this book

Mems. Potts Experimˢ on the Earths & Stones
Margraffe. Achard, Kerwin

Try the matter (called Jews body Cryst. bowls by Mr Cox. 1 lb of the matter } too do ft
½ ~ Alkali

again 1 lb
¼ ~ Alkali } the colour green took a little out with it pel: 30 Matter × 10 Nitre 6 drams purple Cassi, this was semitransparent, but on remelting in became red.

again 1 lb matter
½ ~ Lead
¼ ~ Nitri } this was transparent yellowish as per sample but when remelted turned opake red as per sample
3 drms Cassi

Fried 1 lb Slag
¼ ~ Nitri } think better with Corn. Flint

Lewis's Commerce of Arts, states that Pott fires for red glass.

256 parts	Silex.	160 lb
384	Nitre	24
240	Tartar	15
240	Borax	15
28	Arsenick	1.12
5	Tin	5 3
5	Gold	5 ~

59

The following receipts are copied from memorandums found in Dr. Shaws pocket-book.

Nº 1.

To make brown gold for English China

Take one ounce of grain gold dissolve it in 12oz Aquaregia or warm sand 6 hours then dissolve 5 oz. Green Copperas in warm water strain it thro a linen bag, then pour the gold into it while hot, say into a large bason and filled up with warm water let it stand a while then pour off the water gently six or eight times and dry it very gently.

Nº 2. Another way.

Take 1 oz grain gold dissolve it in 2 oz Aquaregis then take 2 oz Salts dissolved in warm water when all is dissolved put it into a bason and clean it in warm water as above —

4. Orange Red.

Take what quantity you will of green Copperas the Cleaner the better put it into a pipkin with a little water put it on the fire to evaporate till the moisture is gone then pound it fine & put it into a crucible, heat in red hot, then wash it well several times in warm water then dry it for use.

"A Flux for Orange Red"

8 dwts. of pale yellow lead of bright yellow grind coursd and add 1 dwt Calcd Copperas as above -

"A Rose Colour from Gold.

4 dwts Vt Salamoniac put it into a glass matrass or florence flask add 2 dwts Salt petre ground fine 1 dwt finest Gold as thin as you can, say from the gold beaters add one ounce of aquafortis placed and moderate sand heat, when the gold is dissolved which you will know when the ebullission ceases, add 1 dwt Salamoniac and let it remain on the sand 2 hrs and then powr all into a bason and drop it into 4 degrees volatile spirits of Salamoniac tacturized

and the gold will precipitate to the bottom then powr the whole into a bason that will hold 3 or 4 gals and fill it up with boiling water and let it stand 10 or 12 hours, then powr off the water carefully repeat this five or 6 times and dry the powder gently.

This is a very useful colour among the many fluxes made by Mr Hughes at his glasshouse. take 1 oz 5 dwts (suppose of the above preparation) add to it 6 grains Durum or Copperas mix them together & grind very fine then warm it in a crucible over a clear fire so as not to melt till it comes of a pink colour.

The following is what I copied from a book borrowed of a Mr Phillips of Bower St

To dissolve Tin in Aquaregis & to precipitate with this, Gold into a purple or Ruby red Calx. Make an Aquaregis say 3 part Aquafortis & one part of Com. Sand put some small pieces of Tin into it at intervals so that the dissolution may go on slowly, without growing warm or emitting any fumes red or yellow which is particular to be observed the tin

will for the most part dissolve and leave
a little black powder at bottom.
When it will dissolve no more pour the
solution off clear & without any of the sediment
and let no tea remain too long in this solution
(because it is apt to collect a slimy earth or Cake
at the bottom) when the clear solution has
stood by itself for about 12 hours throw
another little peice of tea into it & then the
solution will sometimes acquire a fine
Columbine colour.

August 1st Mixt 6. 0. 0
3. 2. 0 Lead
Alldenash 1. 2. 19 Ash ground
Rough P. 1. 0. 0
Ark 6
12. 0. 25. 2oz Mag

Mixt 6. 0. 0
3. 2. 0 G.L
2. 0. 0 best refd Ash
2. 0 refd Pearl
1. 22 Box
6 Ark 2 Mag
for best metal
12. 2. 0

Aug 5. 6. 0. 0
3. 2. 0 L. G.
2. 0. 0 best ash
3. 0 refd Nit
1. 22 Box
6 AR 1½ mag
12. 3. 0

Remarks. I think the Ash Contains the oxide of Iron of tin in solution requires more Mag. than the Russia Ash. A great part of this salt is Mineral Alkali it does well for Coloured Glass.

---

filled No. 1. no Colour to + S wash
8. Chest + S. W ¼ oz Mag
9. no Colour + S. W
for best Metal Rep this

1806 Flint 65 Green

Aug. 15. took about 1½ frit mixed 1st Inst to which added 14 lb R.L with 4 lb Copper & 4½ C.M, mixt well with about 2½ Green cullet.

Proved very good & clear Coloured

Aug 22. took about same quantity with 10 lb lead 4 lb C.C 4½ C.M which produced about same Metal

---

Aug 21.

A. O. O
D. O. O Fd Lead
O. L. Best P.A.
O. reft Adr
L. OO Box
L. Ch AR

Keep this

10z Mag

Green

Nov Retaken 1616
Other ingredients
Worked added
4oz. C.C 4½ C.M
Colour was dark
took for lead
do for lead
mattes pass
bottle out
Resp 1/2 10

65

keep to this need not be better as on the other side

No. 1. no colour about 2½ pails of frit in a harbour
2. 10z ~ Chest metal & do
8. 1 ~ ~ ~ & SW do
9. no colour L. W & do

St B. 1 & 9. were good Coloured
2. 8. rather too low of a yellowish hue suppose from the Chest Metal.

5.2.0 Yel. O. V.
3.2.0 L. V — g.s Cry —
2.0.0 L — — best Ref.d ash
3.
1.2.6 L. Lt Nitr
oC Box
V aR
3/4 oz Mag

1806
Sep 30.th Blanch V. V.
C. 0. 14
4. 4. R.S
4 14 ark
Lt Aut —
Ol C. S

11.1.8

N.B. The Cakes cast on the Iron Mould turned reddish

Box. Ratcliffe Mount
makes coloured glass for bead
makers

119 lb f.d flint from Staff.d } in a lead barrel
70 " " Cillarge

Repetory of Arts Vol. I. Second series p 334
On colours obtained from Metallic Oxyds. Reds
Rose colours from Iron are made with
Red Oxyd of Iron with Nitric acid & further
Calcined by the Action of fire and Air
on a large surface, if too much heat it
turns Brown, they flux with borax &
Minium in small quantities for paints or
enamelling on Porcelain.

Query would this way colour colour glass
of a red colour.

Coul^r Yellow.

Minium, white lead of Antimony & sand Oxyd of tin is sometimes mixed with it and when requires more lively & nearly a Marigold colour red Oxyd of Iron is added.

Query. Try if it would destroy the flogistion of the Lead & Calcine it with Sand in a moderate heat previous to mixing with the Salts whereby it would more intimately unite with the Sand as stated by Macquer in Repertory Vol. 7 fo. 211. & 272

Lead Vitrified with Arsenick produces a red Colour.

Lead & Manganese
" & Bismuth in equal parts
" 3 parts & " 2 parts
" 2 " " 3 "
" 1 " " 2 "
" 2 " 6 " & ½ part Antg

Mr. Field 84 Newman St. makes stoves for Evaporating & drying —

Lead & Antimony
" & " " equal parts
2 parts " & 1 part "
4 " " 1 " "
4 " " 1 " "
Lead separates sulph: from Antimony
One fourth part of tin alloyed with lead
2 part lead & 1 tin forms Soldan

Lime water boiled for a time
dissolves Ly Harag and evaporated
in a retort leaves Crystals

Seven pounds of Ly Harage to one of
Common Salt makes Mur Alkali
or Soda.

Took about 3/4 of Cl flint put to 2 oz Nan
& 6 lb ArR mill mixed to which put
about 40 Siftings of washed Metal
and filled it into a Pot next day
ladled it out and again repeated mixing
& filling & ladling which made very good
coloured Cullet, but which contained
stone & other impurities, therefore had it
picked & looked over before used for
best metals must the following—

119 & 1/2 flint
70 Gd Lyk
40 Ash
14 Pot
8 Borc
1 1/4 ArR & 1/4 oz Nas

The above mixture with 3/4 each of Four
Washed Metal and the above made Cullet
produced a pot of very good
metal
July 1804. first week.

July took 1.2.0. Com flint frit
6 ArK
6 Nitre
about 1oz Mag
4.2.0 of the small cuttings from washed metal well picked & of this I made some good Cullet.

Again. 1.2.0 flint frit
6 Ark
6 Nit
4oz Mag
4.0.0 small cuttings from Chest Metal when ladled out was too low coloured, would have taken 4 oz more Colour.

July made a pot of Blanch
3.3.0 L
5.2.14 M
1.1.0 St
21 CS
1.14 ArK
17 Ant

very good

took St. 1.3.0
Soda 1.2.23 3.1.23. ground in own mill
Sand 4.0.0
Lead 3.2.0
Ref Nit 3.0
" Ash 1.0.0
" Box .14
ArK 4+203 Mag

12.3.13

This I propose for 4 pots

July. 18. put about 3 wilk washed metal into St. 4 the Colour was good but not fine, partly on acc of Cold furnace and perhaps not salts enough.

Again 24 took 3 to which added 2lb box
4 ref Nit
6 " CS
well mixed & put into —

Aug. 14. Mixed . 6 . 0 . 0
3 . 2 . 0 R. from Mills
2 . 0 . 0 —
2 . 2½ ref. Mit
1 . 0 Box
0 . 4 Ark
Mag 1½ oz

12 . 1 . 25

Aug 21. 6 . 0 . 0
3 . 3 . 0
2 . 0 . 0
2 . 2½
1 . 0
6 Ark 1½ oz Mag

12 . 2 . 27

Same day. 3 . 0 . 0 Coarse Sand
2 . 1 . 0 Lead
1 . 0 . 0
1 . 7 Roy. Nitre
— 3 Ark
4 oz Mag

6 . 2 . 10

..

Filled Stt. No 1. ¼ oz colour & Tr. W too high
Good colour 3 . 1 " " Chestnutal & S. W.
" " 4 . 3 " " " & 1 Ld. Ox & Ark
2nd filling 12 Lb each & 1 oz colour with
Siftings about (19 Lbs fit.)
Good 8 . ¾ oz colour, one harbour Chest nutal
rest washed retort Cullet.
too high 9 . ¼ oz Colour & Tr. W.

N.B. in No 1 . 3 . 8 . 9 . not use more than
10 fit and think less would do when
have plenty Cullet —

2 Lb Resit Materials } soft but
½ " Chalk } Yellow

to 4 to every Ingred. 14 Lb Chalk

Equal parts Sand Chalk & ashes
make very soft glass —

This is the flux recommended wherewith to make the colours following from the Handmaid & the Arts.

No 1. glass of Lead 1 lb
Pearl Ash 6 oz
Sea Salt 2 ~
1. 8

No 2. Glass of Lead 1 lb
P.A 6 oz
Box 4 ~
Ark 1.
1. 11

Glass of Lead is made by Vitrifying 2 lb Red Lead & 1 lb ground flint or Sand.

Composition for Enamelling

No 1. take Glass of Lead 1 lb
P.A ½ ~
oxide of tin ½ ~
} only continue the fusion till Ingotyed or the tin will subside. it may be poured out on a Stone of Iron plate

This should be about the Com. Venetian Enamell -

No 2. Glass of Lead 1 lb
P.A ½ ~
tin ½ ~
Box 2 oz
Cs ½ ~
Ark 1 ~
} Treated as above but be sparing with the heat.

No 3. flint glass. 1 lb
Best Tin ½ ~
C.S ½ ~
P.A ¼ ~
Box 1 oz
} Treat this as before, but may give it more fire and if wanted harder omit the box.

No 4. More white F.G. 1 lb
C.A. ¼ ~
C.S ¼ ~
Box 2 oz
Ar 1 ~
} be sparing of fire as # 2 ——

No 5. F.G. 1 lb
Arg ½ ~
P.A 3 oz
C.S 3 ~
Box 3 ~
Ark 1 ~
} if too soft omit Ark & part of box.

for black Enamel take of
No 1 flux 6 parts
Zaffre 1 ~
Glass Ant. ½ ~
Scale blue ¼ ~
Manganese ¼ ~

Do. take flux No 2. 6 parts and the other Colouring matter as before.

From the Athenaeum of No 12 Dec 1st 1807

Mastic which resists fire & water
Take ½ pt Milk mix it with as much
Vinegar separate the Coagulated parts
& Mix the liquid with the white of 4 Eggs, after having been well beaten, when
the mixture of the two are Compt add quick
lime passed thro a sieve, with which make
a thick paste, which will not liquify when
you use it

From Nicholson's Journal for Nov 1807.

Article Improvement of Pottery

Try. 62 part silex
16 " Alumine
10 " Lime
12 " P. A

also 50 Sil
20 Alum
24 Minium
6 Lime

N B a good Closen Clay would be as well as alum decomposed —

Keffekil of Kerivan contains
50 Silex
14 Magnesia
p Chprok

Chalk does not vitrify with Nitre but with Alkali & Borax

Mar. 3. Try W. Lead Bot of Rowpell

G. Flint	3	0	0
W. Lead	2	0	0
Alkali	1	0	0
Ref. Sit		1	0
S. S			14
Ark			2
Mang			10
	6	1	16

The above served for two pots mix cut washed down cullet each pot W. gross ½ both of which proved clean & good colour but about ¾ oz Manganese out of 1st pot failing. N B Made some plate out of one pot which was much approved by one Tulley of Islington a working Optician S. G. 3.190.

April 7th Again Mixed G. Flint 2 0 0
Lynn S. 3 0
W. Lead 2 0 0
Alkali from Br. 1 0 0
Ref. Sit 1 0
S. S 14
Ark 3
Mang 1½
6 0 14

pretty dry Alkali

G. K took ½ of this batch
say 3. 0. 8 & with town cullet
as before & put No 6. say 12 Oct
9 rose with about 1½ manganese
in the bottom

Flint for best Glass April 1808

Sand 12·0·0
Alka 4·0·0
16·0·0

To every ∞ put lead 50 per Ct. or one half
Nitre 4 ~ ~
Box 3½ ~
Ark ½ ~
Mang 4 oz

Flint 3·0·0 of flint
1·2·0 Lead
21 Nitri
10½ Box
1½ ArsK
¼ oz Mag

Try for Plate
3·0·0 Flint as above
1·2·21
21 Nitri
10½ Box
1½ ArsK
3/4 oz Mag

4 : 3·14

Blood red.

6 lb glass of lead } Melted and refined add
10 lb Com. glass }

in small quantities & small distances of time Copper Calc.d to redness as much as or repeated drops is suffct Then add red Tartar in Powder by small quantities and alternately till it becomes red as blood, Continue either one of the other ingredients till quite perfect

---

Ruby. Gold diss.d in aquaregia evaporate the Menstruum by distillation and add more ArK 5 or 6 times till it becomes a red powder Cast a little of glass purified
Flint should consist of equal parts of Box Nitri & first alkali & ¼ times as much of flint as each of the other Salts

---

Paste for Gems. 6 lb Flint / 3 — Lead / 2 — Alka / 1 — Nitre — or — 6 — Flint / 3 Lead / 3 alk. / 1 Nitre / ½ Box / or 1 Com. Salt / 3 oz ArK

1 B. Nitre & Salamoniac call for th the red colour of gold but that of Ammonia more perfect than Nitre

White Opake Glass
10 lb Compost
1 ℔ Bone ash
} good for nothing

Dictionary or Encyclopædia Britannia
see optics Mr Hollands
proportion of Min. to flint

1st	3 to 1
2nd	2 — 1
3	1 — 1
4	¾ — 1
5	½ — 1
6	¼ — 1

NB. the Receipt was not approved
Lewis says Orschal directs the purple
powder by turn to be ground with Venice
Glass and this to be mixed with the frit
Sayeq. equal parts Box, Nitre & frit alKali & 4 times as
much Silex as each of the Salts.
Kunckel mentions another way of preparing
the powder, take gold & dissolve in Aquaregia 3 or 4
times till it looks like Rebel then precipitating
with strong alkaline Ly & wash with water, dissolve
the powder in Spirit of Salts & precipitating again
"Commerce of the Arts"

May. 6. Mixt 3.0.0 & flints
Cash 1.0.0 wet
Lyth 1.2.0
Ox. Lead 1.2.0
Mixt 21 oz 2 lbs
Box 11½
1½ Marg

7.1.4½

filled 7 Pots & 9 colour again ½ oz & small Q. metal
2nd filling ½ oz more colour & when well melted
ladled out & refilled with what frit was
left adding 1 oz more Marg. after all was
low coloured & I think not salts enough
Ladled out & used next week as over leaf.

May 20th Mixt for Blanch. Lead 5.2.14

	Lead	3.3.0
Ref.	Nitre	1.1.0
muriate	Soda 21	2.21
Ars	1.14	
Regalas Ant	14	
		11.1.7

NB. This proved good except in turning
red in the leath which cannot
account for.

May 20. Mixed for Plate 3.0.0
W. Lead 1.2.0 2.1.0
Lisbon 3.0. Extra 25
Box 14

Mag. in the batch 5.2.11 4 oz

batch left out 1.1.6

4.1.5

This was filled into No 9. with 1 oz Mag at bottom next filling 1 oz more & yet it was too low, from the Cullet being so, which was ladled out of No 6, but was of same specific gravity as the above mixture next time put in batch 6 oz colour

N.B. out of this pot was made some Optic Plate and also Globes both of which were very good.

Glass to resemble the Philosophers stone

Take of 2nd Composit for hard glass 1 of the compost for paste each 5 lb of highly Calc'd Iron 1 oz must well fuse, till the Iron be perfectly vitrified & has tinged the glass of a deep brown yellow —
powder this glass & add to it 2 lb glass of Antimony and grind them together take part of this mixture and sub into it 80 or 100 leaves of Dutch Gold.
Mix the powder containing the leaf Gold with the other glass and fuse the whole with a moderate heat, but avoid perfect liquefaction because that will destroy the beauty.

Gold yellow by Dr Lewis
2 parts of Glass Antimony
2 " " Alumen
3 " " flint

Mr Mace found the following the best for reeing the yellow.

Sand 2 parts } or Sand 2 } or Sand 2 parts
Alka 3 " } or Salt 3 } or Salt 2 —
Box 1 } Box 1 —

Sold Coloured Spangles may be
diffused thro the glass by mixing the
yellow Flakes with powdered Glass and bring
the matter into fusion —
From the Encyclopedia Britannica

1808. May 28. White for Ware.

Silex 1.3.0
1.2.7 Ly
2.11 refs. Nit
2 ½ ark
F. 1.1 Lime or Chalk
Ct. 4.1.8

Better with Alkali than Nitre

Ladled the 1st
boiling and returned
it with the rest of
the frit

NB. May white but in next put ½ Nitre &
56 lb pearl Ashes, Chalk Coast with
Alkali & Box.

To purify Com. Salt dissolve it in Water
and drop in a solution of Alkali & the
earth will precipitate —
Again to a solution drop in a solution of Chalk
Again " " " " " " " " Lime

Dark brown for Mr Jassee Mar 1809.

2 lb blk Glass Calc. by May	thirty times		60
½ " blue " " Ziffes	—	—	15
1 " flint frit "	—	—	30
4oz Salenda Burnt	—	—	7½
2 — Crocus Mart	—	—	3¾

This was too deep colour, suppose 1½ lb less
colour next or more frit, next try same
quantity of Manganese as Salenda & bid may
do without C.M.

Vitrified 3 lb Carb. pot Ash
4½ Sand
½ Lime
} remains to be remelted

Try some of the above Glass ground &
add manganese with a small
quantity flint Glass for the
Carum Goraan Colour.

Friday 14th July 1809.

5.2.14 Lyth
2.0.0 Sand
1.3.0 dos Muriate Soda dry 20 p.c Salt to and
1.0.14 ref.e Nitr ground fine
1.14 Ark
12 S. Silex
10.3.26 Mang 8.0z.

N.B. Think this was the best Fever made about half Cullet So that I am of opinion to melt it first & ladle it into water is best

Chaptals Chem.y Englisd Edetion Vol. 4. page 355. Alkali for Sope to purify boras page 359, Crude Tincal dissolved in a weak solution of Soda & properly concentrated by evaporation yields beautiful Crystals —

To Make Kermes same Vol. Prepare a ley of Caustic potash & boil it for half an hour upon barly one fifth of pulverized sulphure of Antimony. The boiling solution is to be filtered thro a Cloth and obtain by cooling it only, an abundant precipitate which requires only to be dried in order to form the kermes. may boil a fresh quantity of Ants in order to obtain a new dose but they will be paler (it is necessary to wash in the cold water to separate the Alkali) If the remaining liquor be cooled & decomposed by an acid it will afford the yellow or gilded Sulphur of Antimony.

Same Vol page 215.

1809 July 21st for Opal.

enamel frit 1.2.0
0.16 Ars
2 bone ash
} well mixt

2.3.0 small flint Cullet

on working was flinty but on heating up again became a beautiful opal as per sample B
Sold the Case to Mr Tassie.
The above proving too flinty next week made as under

1.1.0 Enamel frit made 14 Sept
6 Ars
3 bone ash
3 whiting
5.0.0 small flint metal or siftings

4.1.12 which was much approved by Mr Tassie. sample C

July 28 best metal 6.0.0 Qr. Lilac
2.0.0 Red Lead
2.0.0 Litharge
2.1.0 alkali 14pc water
2.0 Nitre
1.0 Borax
Manganese 5oz

filled 1st ½oz Mag
2nd ½ " } Proved good

Commerce of the Arts by Lewis.
fo. 324. Black Cobalt would tinge Glass
441. Coloured Clays, several slates &
Labrador Stone melt into a black glass
the most perfect black is obtained by adding
a mixture of two or more of the above darkening
materials, & instead of taking colourless glass or enamel
for the bare use fragments of different colours
glass & Compositions which have been spoilt
in tinging & tinge them.

"A More perfect Black"

Equal weights of Manganese Zaffer & scales of
Iron; say one part of these mixtures to
15 or 20 of the bare of enamels, which bare
is equals parts lead & tin Calx? with
one weight of frit or powdered glass of the Calces.

Commerce of Arts page 144.

Grummet is of opinion that the purplish Colour will appear by melting Venice Glass with ½th of Nitre without any gold, and that in a 100 repetitions it scarcely failed once and that neither Nitre nor Gold Precipitate were found to give any thing of the admirable Colours, to those kinds of glass which have no magnesia in their composition

see also article Glass fo. 248.

Loysels ponderous glass for Aeromatics purposes is

100 parts Silex
150 red Lead
30 Pearl Ashes
10 Calcd borax

Dorfourgeais optic glass weigh 3,588 —

Commerce of Arts for Yellow Glass omit Salt Petre when Antimony is used viz. Glass of Antv. / Menium / Calcd Flint } in equal parts

2 parts Glass of Antv.
2 — Mium
3 — flint glass ground

In transparent reds, wt. Oxyde of Antimony and Nitre may be used with the gold.

9o Commerce of the Arts by Lewis

to make Ink.

1oz Vitriol
1 — Logwood
3. nut galls
3 pints water

boil ½ hour and add as much water as will make up what evaporated strain thru a sieve or Cloth & add 1½ oz Gum ——————

Enamell Glass 2oz.
flint 2 —
flake w! 2½ —
Box ½ —
Marig 10 grains

The following appears a proper proportion ½ lb flint Pellet ground
½ — Tartar
½ — Copper
¼ — Crocus m
repeated omitting C. m
add Regulus of Antimony 4oz

92

2. 3. 21. Silk
1. 3. 14 Silex
2. 0 Nitre
18 Mist
24 Ac
24 Carb. Lime
4 B
1 Mang

3. 32 14 April 1812
0. 0

Repeated Lully 2nd except the lime and Mang
system

93

Good workable Glass without Lead

Silex	8 parts	80
Alkali	6 "	60
Borax	1/4 "	2 1/2
Lime	3/4 "	4 1/2
Mang	1/16 "	3/4
		Nit 56.

NB. Dry Arsenic

Repertory of Arts Vol. 10-2nd Series page 312

Process of Chaptal & Berard for decomposing Sea Salt & extracting the Soda from it.

"Take four quintals of litharge or red Lead well sifted. distribute in equal parts into glazed earthen vessels. Dissolve in another place or wooden vessel a quintal of sea Salt in about four quintals of water pour into each of the four vessels a quarter of this solution in order to form a paste of slight consistance, Leave the whole at rest for some hours and when you perceive the surface to whiten, it must be stirred with a strong wooden Spatula without this the paste would become very hard and great part of the Sea Salt would escape decompos^{n}; it must be stirred continually as it thickens & diluted with fresh quantities of water & Sea Salt so as to always keep it of the same consistancy.

If there be not enough of the solution of Sea Salt and water - water alone must be used towards the end of the process, in 24 hours the result will be a homogeneous paste very white without lumps, presenting a mass much more than the litharge employed, leave the mass in the vessels 24 hours longer and stir it from time to time, that the composition may be effected.

In order to separate the Soda dilute the paste with a sufficient quantity of boiling water pouring in a little at a time & stirring continually for without that the paste becomes lumpy and very difficult to wash.

Decant the clear solution and filter the residuum in a linen cloth, evaporate the liquor in an Iron vessel to obtain the Soda dried.

Products of this operation is Muriate of Lead "This muriate calc^{d} produces a yellow colour solid and brilliant & may be employed successfully with Oil ——

If Sulphuric Acid, wakened 20 @ 25 degrees of the Aerometer, be poured upon the Muriate of Lead it immediately appears to a dazling white. the Mass diminishes conerably in size and there results a Sulphur of lead.

this salt is washed afresh in a great deal of water and mixed with the greatest care in Mills similar to those in Holland and afterwards put to dry in porous crucibles If the Sulphate of lead be decomposed by a solution of Alkali the Oxyd precipitated is of a stronger consistance than the Sulphate

Chaptal. when the pure Earths are exposed with Borax to a heat 22 @ 26 degrees Wedgwood and kept up two hours the following are the results. No. 1. one part Silica & 2 borax produced a beautiful pure transparent glass
No. 2. one Alumine & 2 borax a beautiful glass of vivid green
No. 3. one Lime & 2 borax. a slight yellow tint
4. one Manganese & 2 borax. Milky
5. one Barytes & 2 " Colourless rather Yellow

Chaptal Vol IV. page 259.

"Crude Tincal dissolved in a weak solution of Soda & properly concentrated by evaporation, yields beautiful Crystals, the product exceeds by 5 or 6 per Ct that which is obtained by using only Tincal, but this way is subject to efflorescence.

Page 265.

Natron dissolved in lime water and the Crystals set aside which are formed on cooling the liquor, the lixivium is then evaporated & the residuum dissolved in milk of lime, this also evaporated to an extract which is employed to answer the purposes of borax.

Borax is soluble in 18 parts water at 60° & in 6 parts at 212°

Philosophical Transactions
~ Vol. 55. page 10.

Gold which is the densest of all metals imparts a red colour to glass, whenever it is divided into particles so minute that it can be intimately mixed with the ingredients of which the glass is made and it seems indifferent in what manner it is reduced to this state.

1st. From the powded obtained by rubbing Gold with a pumice stone used by the Goldsmiths in polishing it mixed with Nitre, borax & potash a beautiful red Glass is produced.

2nd. When a solution in Aqua regia is evaporated on a glass plate with a gentle ~~plate~~ heat is tinged red.

3rd. Artificial Rubies are made by mixing with glass, gold dissolved in Aqua Regia & afterwards calcined in a furnace

4th. Kunkel prepard a powder for the same purpose by precipitating the gold by Alkaline liquor.

5th. Gold precipitated by tin & melted with glass in a proper proportion tinges it of a ruby colour. 6 grns to 1 lb.

6th. The same colour is produced by fusing gold with a large proportion of tin & two thirds of lead or by mixing it with Regulus of Antimony or tin by calcined and added to glass the powders of gold obtained from these processes —

7th Gold Amalgamated with mercury & digested with it for considerable time may be reduced to a subtile powder by expelling the mercury, this powder melted into the glass tinges it red.

Lead which is the metal whose density is next in order to gold affords a glass of the colour of the Hyacinth as with the mixture of yellow writers on Optics call it yellow.

1st Lead kept in fusion for a considerable time in a strong crucible & a very violent heat is reduced to a glass of a yellow colour

2d Lead reduced to litharge & melted with one third or fourth part of its wt. of sand in a covered crucible in a strong fire for 2 or 3 hours is reduced to orange coloured glass.

3rd Glass of Lead is mentioned by Neri, Merret & Shaw as a Composition proper for imitating the Hyacinth.

Silver

Silver - yellow is the only colour which silver the metal next to lead in density can by any process be made to impart. to glass

3rd If Silver be calcined with sulpher it readily gives a yellow colour to glass

4th Having carefully purified an ounce of Silver I kept it in fusion some hours with a small quantity of glass and found that the glass when cold had formed a beautiful yellow enamel on the surface of the Silver

5th Leaf Silver laid on red hot glass & tinges it yellow.

Page 31.

Lunx corned imparts to glass a yellow colour

Copper.

Reddish Green is the only colour which copper next in density to Silver gives to glass without any additional ingredient.

1st by grinding in a copper mortar and melting with glass becomes green.

2nd Calcined pyrites in a furnace

3rd " with sulphur

4th Copper scales gives a green colour.

It is indefferent in what manner the Copper is prepared If a quantity of Salt be added to the preparation it will make the glass bluish. It is true that copper is mentioned by some writers as an ingredient in red glass and enamel, but the red which is the colour of metal not dissolved or mixed with the glass remains only while the composition is exposed

to such a degree of heat as is too small to melt and incorporate it for if it be suffered to remain in the furnace after the copper is added the mass will be green and not red.

Note. Shaws Lectures page 29. Copper precipitated with Com. Salt out of Aquafortis gives the turquoise colour to white glass.

Iron. 25.

Note by Neuchel. I had calcined in a Pot fillings of Styrian Steel. I mixed about ½ a grain Ground well in a glass mortar with 15 grains of flint glass and a very fine alkali, put the whole into a crucible and exposed to a violent heat, produced a fine Sapphire blue.

Yet is not capable of being reduced or imparting any colour to glass nor are any preparations of it of any primary colour.

37

Boerhaave note. If green vitriol reduced to powder be calcined in a crucible in a moderate heat and in an open strong fire it grows yellow red, and at length becomes a deep purple powder.

February 17. 1815. S. Dudley.

A. 2 oz. Ty — G
18 " T. N. I
12 " C — M
4 " N. T. I
11 " G. I. T
1/4 B, x

If 2 oz. Arsenic added it will be whiter & omit 2 oz. Stibii.

B. 2 oz. T — G
16 " T. N. I
12 " C — M
4. N. T. I
10. G. T. T
1 3/4 B. X

C 4 oz. T — G
16 " T. N. T
8 " C. M
3 " N. T. I
6 " G — Ty
1 " B, X

	Twice	Ten	Twice Ten
D. 2 ℥ Y. G. ʒ	4	2.8	5
18 - Y. N. I ʒ	2.4	22.8	45
14 - Co ʃ L	1.12	14.8	35
5 . N. Y. R	10	6.4	12½
10. G - Y	1.4	12.8	25
1¾. B - X	4	2.8	5
50¾ or 3. 2¾	6.6	63.12	127½

N B. The Co ʃ L is supposed to make it yellower S. D & N. Y. R whiter.
If half G. Y & half S. D pr. Muriate Soda renders it softer

The following is what I made 4th March 1815.

2. 4 Y. N ʒ
4 ~~Y G~~ ʒ
1. 12 Co ʃ L ʒ
10 N Y. I ʒ
12 S. D. Y. Y
9 Lac p. M. N
4 B — X

6. 4

If I make it yellower add 180 pr. Y — N or 30 gr. every lb — add 10 ℥ to 16 lb.

If this is not sufficiently soft & mucilaginous add 2 ℥ Gum Arabic to every 16 ℥ of Lac

If this is too soft & yellow add 2 ℥ Gum Arabic to every 16 ℥ of Lac

If this is too hard & white add 2 ℥ Gum Arabic to every 16 ℥ of Lac

If this is too hard & yellow add 2 ℥ Gum Arabic to every 16 ℥ of Lac

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2 - 4 } 4 }
1 - 12 } 10 }
1 - 8 } 4 } S. X p M S
B — X

If this is very soft

E

March 8th 1815

	three times	eight	twice
a 2. Y. G	6	3-0	6
1 a 2. A. G. Y	3.6	24	54
12. C – M	2.4	18.0	36.
3½ A. G	10½	5.4	10½
11 – G. A – C	2.1	16.8	33
1½ – B – C	4½	2.4	4½
	9lb.	72.	144

March 10th Mixed 144 lb & melted for eighteen hours then ladled it out and keep for remelting.

E

80 lbs matter E ground
4 lb B – C
3 – A. R. I

84. remelted for eighteen hours occasionly stirring with an Iron rod produced sample D/G

88 lbs of the matter E ground fine
4½ – B – C
4 – A R. I
50 Y, N

remelted hours stirring occasionally produced sample

May 20th 1815

Mixed	2.4	
	4	2.8
C.R.M	1.8	
N.I.J	6	4.14
J.N.J	1.10	
Box	8	
Bone	4	2.8
Ark	2	
		6.14

Yellowish Cullet 4½ lb.
the above fritt 2 "

6½ produces C

again frit 3
Yellowish Cullet 2 3/4

5 3/4
Produced H

Liquor to dissolve Iron.
from Dr. Bollman 20 Dec. 1814.

Take any quantity of Corn. Salt dissolve it in a sufficiency of cold water and then add gradually and constantly stirring oil of Vitriol at the rate of eight pounds for every ten pounds of salt employed.

The Liquor should be prepared and the opperation afterward performed in a large Stone or Glass vessel. The Liquor will become hot whilst the oil of Vitriol is adding

April 1820. A very good workable lot Enamel Glass

77	Lac
84	Min
28	Nitre
16	Ars.
10	Lime
2	Box + ½lb Antimony
1	Muriate Soda
56	Flint Glass Cuttings

244

Country white.

100 Sx.
110 Mun
36 Peter
26 Ark
20 Lime

or

180
180
60
30
28

for Coloured Glass

90 Ash dry
240 Mix
240 Tiles

To this quantity 8 lb Zaffer
8 oz Oxide Cobalt.

Optic Aug! 1825

3.0.0
2.2
1.0.14 Ash
1-0 Salt
14 Box
3½ oz
Manf
Arsen 2½

3.0.0
3.0.0
1.0.0
0.24 Salt
21 Box
Manf 3½
Arsen 2½

June 1828 by this.

French 10 0
150
30 dry ash
10 Calc? Box
3 oz Manganese

Aug. 1822

Common way for best metal

9. 0. 0
6. 0. 0 Tipton Mill
3. 0. 0 Damp
3. 14 Nit

Manga 5½
S. G. 3,220

Melted and ladled, remelted with a portion of frit (good bright metal) S.G.

9. 0. 0
5. 1. 14 Potts Lick
3. 0. 0
3. 14 Nit

½ oz Mang

very bright glass S.G 3149

Aug 1822.

Lx	3. 0. 0
Lith	2. 2. 0
Ash	1. 0. 0
Nit	20
Box	4
MS	6
	6. 3. 5

Mang 3oz
Anth 2½

NB. this was very cordy ladled out requires more Alkali

1

15th February 1832

Mixed	12	0	0	Land
	8	0	0	Tipton Lead
	4	0	0	
	1	0	0	
		14		
		1	11	3

THOMPSON & SON
BROADSTAIRS
Name .....
No.....