

Glass Batch Calculations -- In Class Example

Mole quantities of stoichiometric raw materials

	MW>	60	102	62	70	56	44	18	
	Cost	SiO2	Al2O3	Na2O	B2O3	CaO	CO2	H2O	Total
	[\$/ton]								
Sand		1							60
Soda Ash				1			1		106
Limestone						1	1		100
Feldspar		6	1	1					524
Borax				1	2			5	292

Oxide weight percents for raw materials

	Cost	SiO2	Al2O3	Na2O	B2O3	CaO	CO2	H2O	Total
	[\$/ton]								
Sand	\$ 15	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%
Soda Ash	\$ 95	0.0%	0.0%	58.5%	0.0%	0.0%	41.5%	0.0%	100%
Limestone	\$ 22	0.0%	0.0%	0.0%	0.0%	56.0%	44.0%	0.0%	100%
Feldspar	\$ 145	68.7%	19.5%	11.8%	0.0%	0.0%	0.0%	0.0%	100%
Borax	\$ 250	0.0%	0.0%	21.2%	47.9%	0.0%	0.0%	30.8%	100%

Batch Formula calculation

	Batch Wt, pounds	Cost	SiO2	Al2O3	Na2O	B2O3	CaO	CO2	H2O	Total
		[\$/ton]								
Sand	1159	\$ 9	1158.8	0.0	0.0	0.0	0.0	0.0	0.0	1158.8
Soda Ash	430	\$ 20	0.0	0.0	251.4	0.0	0.0	178.4	0.0	429.8
Limestone	429	\$ 5	0.0	0.0	0.0	0.0	240.0	188.6	0.0	428.6
Feldspar	205	\$ 15	141.2	40.0	24.3	0.0	0.0	0.0	0.0	205.5
Borax	209	\$ 26	0.0	0.0	44.3	100.0	0.0	0.0	64.3	208.6
			1300.0	40.0	320.0	100.0	240.0	367.0	64.3	2431.3

Total Batch 2431.3 \$ 75
 Total Glass 2000.0
 Glass/Batch 82.3%
 Batch/Glass 1.216

	SiO2	Al2O3	Na2O	B2O3	CaO			Total
Target Composition	65%	2%	16%	5%	12%			1.0
Calculated	65%	2%	16%	5%	12%			100%
Difference	0%	0%	0%	0%	0%			
Tolerance 5%	5%	5%	5%	5%	5%			