ATTACHMENT 12

PARTICULATE GENERATION FACTORS

PARTICULATE GENERATION FACTORS

CHEMICAL NAME	FORMULA	REACTION	SOLID PRODUCTS	GASEOUS PRODUCTS	POTENTIAL PARTICULATE (LB PART./LB FEED)
Aluminum Powder	Al	$4Al + 3O_2 \rightarrow 2Al_2O_3$	Al_2O_3	-	1.89
Ammonium Nitrate	NH_4NO_3	$2NH_4NO_3 \rightarrow 2N_2 + O_2 + 4H_2O$	-	N_2, O_2, H_2O	0
Antimony Trisulfide	Sb_2S3	$2Sb_2S_3 + 9O_2 \rightarrow 2Sb_2O_3 + 6SO_2$	Sb_2O_3	SO_2	0.86
Barium Carbonate	$BaCO_3$	$BaCO_3 \rightarrow BaO + CO_2$	BaO	CO_2	0.78
Barium Chromate	$BaCrO_4$	$2BaCrO_4 \rightarrow 2BaO + 2CrO_2 + O_2$	BaO, CrO_2	O_2	0.94
Barium Nitrate	$Ba(NO_3)_2$	$2BaN_2O_6 \rightarrow 2BaO + 4NO_2 + O_2$	BaO	NO_2, O_2	0.59
Barium Peroxide	BaO_2	$2BaO_2 \rightarrow 2BaO + O_2$	BaO_2	O_2	0.91
Barium Stearate	$Ba(C_{18}H_{35}O_2)_2$	$BaC_{36}H_{70}O_4 \rightarrow BaO+36CO_2+35H_2O+86.5O_2$	BaO	CO_2, H_2O, O_2	0.22
Black Powder					
Charcoal(75%)	C	$C + O_2 \rightarrow CO_2$	-	CO_2	0
Sulfur(10%)	S	$S + O_2 \rightarrow SO_2$	-	SO_2	0
Potassium Nitrate(15%)	KNO_3	$4KNO_3 \rightarrow 2K_2O + 4NO_2 + O_2$	K_2O	NO_2, O_2	0.47
Boron	B	$4B + 3O_2 \rightarrow 2B_2O3$	B_2O_3	-	3.22
Calcium Carbonate	$CaCO_3$	$CaCO_3 \rightarrow CaO + CO_2$	CaO	CO_2	0.56
Calcium Silicide	$CaSi_2$	$2CaSi_2 + 5O_2 \rightarrow 2CaO + 4SiO_2$	CaO, SiO_2	-	1.83
Calcium Resinate	Organic with calcium; assume all is calcium and products are CaO				1.00
Calcium Stearate	$Ca(C_{18}H_{35}O_2)_2$	$CaC_{36}H_{70}O_4 + 52O_2 \rightarrow CaO + 36CO_2 + 35H_2$	CaO	CO_2, H_2O	0.09
Carborundum	SiC	No Reaction (pg. 642, ref.1)	SiC	-	1.00
Copper Powder	Cu	$2Cu + O_2 \rightarrow 2CuO$	CuO	-	1.25
Dichromated Aluminum	$AlCr_2O_2$	$4AlCr_2O_2 + 3O_2 \rightarrow 2Al_2O_3 + 8CrO_2$	Al_2O_3, CrO_2	-	1.34
Ground Glass	-	No Reaction	glass	-	1.00
Lead	Pb	$2Pb + O_2 \rightarrow 2PbO$	PbO	-	1.08

PARTICULATE GENERATION FACTORS (Continued)

CHEMICAL NAME	FORMULA	REACTION	SOLID PRODUCTS	GASEOUS PRODUCTS	POTENTIAL PARTICULATE (LB PART./LB FEED)
Lead Azide	$Pb(N_2)_3$	$PbN_6 + 6.5O_2$ ---> $PbO + 6NO_2$	PbO	NO_2	0.77
Lead Oxide	PbO	No Reaction	PbO	-	1.00
Lead Nitrate	$Pb(NO_3)_2$	$Pb(NO_3)_2 + H^+$ -----> $PbO + 2NO_2 + H_2O$	PbO	NO_2, H_2O	0.67
Lead Styphnate	$PbC_6HN_3O_8$	$PbC_6HN_3O_8+O_2$ --->$PbO+CO_2+NO_2+H_2O$	PbO	CO_2, NO_2, H_2O	0.50
Lead Thiocyanate	$Pb(SCN)_2$	$PbS_2C_2N_2 + O_2$ ---> $PbO + SO_2 + CO_2 + NO_2$	PbO	CO_2, NO_2, SO_2	0.69
Magnesium/Aluminum	Mg	$5Mg + O_2 + N_2$ ---> $2MgO + Mg_3N_2$	MgO, Mg_3N_2	-	1.49
	Al	$4Al + 3O_2$ ---> $2Al_2O_3$	Al_2O_3	-	1.89
Magnesium	Mg	$5Mg + O_2 + N_2$ ---> $2MgO + Mg_3N_2$	MgO, Mg_3N_2	-	1.49
Nickel	Ni	$2Ni + O_2$ ---> 2NiO	NiO	-	1.27
Potassium Chlorate	$KClO_3$	$KClO_3 + 5H^+$ ---> $KOH + HCl + 2H_2O$	KOH	HCl, H_2O	0.46
Potassium Nitrate	KNO_3	$KNO_3 + H^+$ ---> $KOH + NO_2$	KOH	NO_2	0.55
Potassium Perchlorate	$KClO_4$	$KClO_4 + 8H^+$ ---> $KOH + HCl + 3H_2O$	KOH	HCl, H_2O	0.40
Potassium Sulfate	K_2SO_4	$K_2SO_4 + 3H^+ + O_2$ ---> $2KOH + H_2SO_4$	KOH	H_2SO_4	0.71
Red Phosphorus	P	$4P + 3O_2$ ---> P_4O_6	P_4O_6	-	1.77
Selenium	Se	$Se + O_2$ ---> SeO_2	SeO_2	-	1.41
Silicon Carbide	SiC	No Reaction (pg. 642, ref.1)	SiC	-	1.00
Sodium Oxalate	NaC_2O_4	$2NaC_2O_4 + O_2$ ---> $2Na_2O + 4CO_2$	Na_2O	CO_2	0.56
Sodium Resinate	Organic with sodium; assume all is sodium and products are Na_2O		Na_2O	-	1.00
Sodium Sulfate	Na_2SO_4	Na_2SO_4 ---> $Na_2O + SO_2 + 0.5O_2$	Na_2O	SO_2	0.44
Strontium Nitrate	$Sr(NO_3)_2$	$2Sr(NO_3)_2+6H^++O_2$--->$2Sr(OH)_2+4HNO_3$	$Sr(OH)_2$	HNO_3	0.57
Strontium Oxalate	$SrC_2O_4H_2O$	$2SrC_2O_4{\cdot}H_2O+O_2$--->$2Sr(OH)_2+4CO_2+2H_2O$	$Sr(OH)_2$	CO_2, H_2O	0.63

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Strontium Peroxide	SrO_2	$SrO_2 + 3H^+ \text{---> } Sr(OH)_2 + H_2O$	$Sr(OH)_2$	H_2O	1.02
Sulfur	S	$S + O_2 \text{---> } SO_2$	-	SO_2	0
Tin	Sn	$Sn + O_2 \text{---> } SnO_2$	SnO_2	-	1.27
Tin Dioxide	SnO_2	No reaction	SnO_2	-	1.00
Zinc Stearate	$Zn(C_{18}H_{35}O_2)_2$	$ZnC_{36}H_{70}O_4 + 52O_2 \text{--->} ZnO+36CO_2+35H_2$	ZnO	CO_2, H_2O	0.13
Zirconium Dioxide	ZrO_2	No reaction	ZrO_2	-	1.00
Zirconium/Nickel	Zr/Ni	$Zr + 2Ni + 2O_2 \text{---> } ZrO_2 + 2NiO$	ZrO_2, NiO	-	1.35
Zirconium	Zr	$Zr + O_2 \text{---> } ZrO_2$	ZrO_2	-	1.35