

Smoke Compositions

White smoke

Source: "Mengen en Roeren"[6], page 224.

Comments:

Preparation:

Potassium nitrate.....	4
Charcoal.....	5
Sulfur.....	10
Wood dust.....	3

Red smoke

Source: "Mengen en Roeren"[6], page 224.

Comments:

Preparation:

Potassium chlorate.....	15
para-nitroaniline red.....	65
Lactose.....	20

Green smoke

Source: "Mengen en Roeren"[6], page 224.

Comments:

Preparation:

Synthetic indigo.....	26
Auramine (yellow).....	15
Potassium chlorate.....	35
Lactose.....	26

Smoke composition #1

Source: rec.pyrotechnics

Comments: Different sources mention different compositions. The most often mentioned one is given here.

Preparation: The mixture is most successful when prepared by melting the sugar and potassium nitrate together on low heat, but this requires good stirring, and there is a risk of accidental ignition. The molten mixture can be poured in cardboard containers and a fuse inserted while the mixture solidifies.

Potassium nitrate.....	50
Sugar.....	50

Smoke composition #2

Source: rec.pyrotechnics (composition is an U.S. military smoke composition)

Comments: The mixture is difficult to ignite. Hexachloroethane is poisonous, and can be replaced by 72 parts PVC. This, however, makes the mixture yet harder to ignite. The zinc oxide can be replaced by titanium dioxide (2 parts ZnO replaced by 1 part TiO₂). The smoke is slightly irritating

and not suitable for indoor use.

Preparation:

Zinc oxide.....	45
Hexachloroethane.....	45
Aluminum.....	10

Smoke composition #3

Source: "Spelen met vuur"[9]

Comments:

Preparation:

Zinc powder.....	35
CCl4.....	41
Zinc oxide.....	20
Diatomeous earth.....	5

Smoke composition #4

Source: "Spelen met vuur"[9]

Comments:

Preparation:

Zinc powder.....	25
CCl4.....	50
Zinc oxide.....	20
Diatomeous earth.....	5

Smoke composition #5

Source: Kirk-Otthmer technical encyclopedia[8], chapter 'Explosives and Propellants'.

Comments: Heat of reaction: 2.579 kJ/g, Gas volume: 62 cm³/g, ignition temperature: 475 C, impact sensitivity test: 15% of TNT

Preparation:

Zinc.....	69
Potassium perchlorate.....	19
Hexachlorobenzene.....	12

Colored smokes

	Shimizu	Pihko	Shimizu	Shimizu	Pihko	Shimizu	Shimizu	Shimizu	Pihko	Faber
color	Blue	Blue	Green	Red	Red	Violet	Yellow	Yellow	Yellow	Brown
Potassium chlorate	28	33	28	25	24	26			24	
Potassium nitrate							25	43		47.4
Sulfur							16	10		3.9

Realgar				59	37
Wheat flour	15	15	15	15	
Lactose		25		16	16
Quinoline Yellow					43
Rhodamine B			24	40	16
Para Red			36	21	
Methylene Blue	17	17			
Phthalo Blue		40			
Indigo Pure	40	30		22	
Auramine		10			
Charcoal					4
Sand					4
Calcium carbonate					4.9
Borax					10.6
Pitch					29.2
Sodium bicarbonate			4		6
Dextrin		2	2	6	2

White smokes

Shidlovsky Becher *Lancaster* Shimizu Shimizu Shimizu

Potassium chlorate	20	40	29		
Potassium nitrate				48.5	66
Ammonium chloride	50	45			
Hexachloroethane			50		

Zinc powder		28	
Zinc oxide		22	
Sulfur		48.5	
Realgar		3	13
Naphthalene	20		
Montan wax		12	
Kieselguhr		3	
Charcoal	10		5
Lampblack			5
Cinnamic acid		27	
Lactose		29	
Kaolin		15	
Dextrin			11

Grey smokes

Izzo Ellern

Potassium nitrate	10	
Hexachloroethane	50	45.5
Zinc powder	25	
Zinc oxide	10	45.5
Calcium silicide		9
Colophony resin	5	

Black smokes

	<i>Lancaster</i>	Lancaster	Shimizu	Shimizu	Shimizu	Shimizu	Shimizu
Potassium perchlorate			56				57
Potassium chlorate				44			
Potassium nitrate		60					
Hexachloroethane	60				62	62	
Anthracene	20		33			23	40
Naphthalene				26	23		
Magnesium powder	20				15	15	
Sulfur		3	11				
Antimony trisulfide				24			
Sawdust		26					
Liquid tar		7					
Charcoal							3
Red gum		4					
Dextrin				6			+7