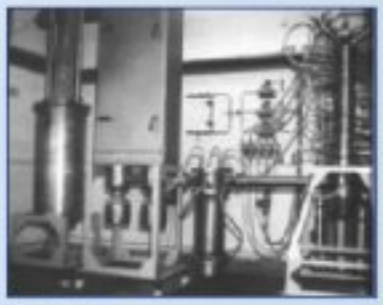
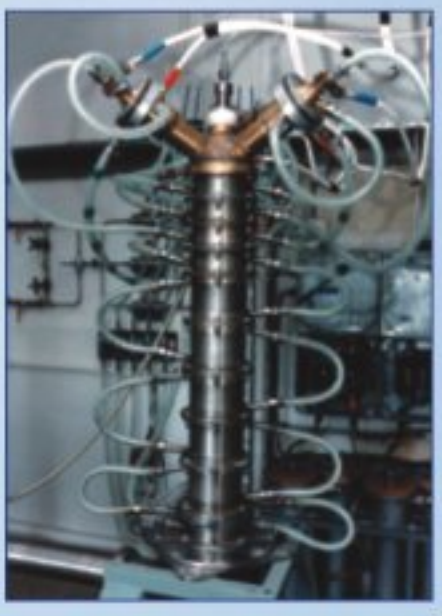
Toxic Chloroorganic Materials Processing





Plasma plant with the power 100-200 kW was designed for toxic chloroorganic materials (such as methylene chloride (CH_2Cl_2), trichloroethylene ($C_2H_3Cl_3$), polymethyl methacrylate, polyether MGF-1, benzophenone (C_6H_5-CO-C_6H_5), alcohol-gasoline blends with colophony adding, waste motor, transformer and other oil and another organic waste with toxic adding) processing.

The plant consists of plasma torches PDS-3, three jet mixing chamber, plasma bus reactor and exhaust gas purification system.

Material	Exhaust gas composition (chemical analysis)			
	Methods of material feeding	NO, vol.% (with SB adding)	Cl_2, mg/l (free chlorine)	Chlorides (mg/l)
SB+AGB	Jet dispersion	6,2	81,2	0,045
SB+AGB		11,0	74,1	0,037
SB		6,07	52,9	0,02

SB *– stillage bottoms with methylene chloride.*

AGB *– alcohol-gasoline blend with colophony.*

Material	Plasma reactor operating parameters			
	$\sum N$, кW	$T_{w.-gas}$, K	G_p, g/s	$\sum N/G_p$, кW/kg
SB+AGB	93,6	5716	3,6	7,22
SB+AGB	93,6	5716	3,6	7,22
SB	100,8	5680	3,6	7,77

Electric Arc Plasma Torch

Parameters \ Model	Direct current plasma torch PDS-3	Alternating current plasma torch PPT
Plasma forming gas	nitrogen, argon, oxygen, air, natural gas, hydrocarbons gas mixture	nitrogen, argon, oxygen, air, natural gas, hydrocarbons gas mixture
Current	100-300 A	100-600 A
Supply voltage	500 V	~220 V, ~380 V, ~450 V
Power	50-100 kW	50-220 kW
Plasma forming gas consumption	2-10 g/s	3-30 g/s
Efficiency	no less than 75 %	no less than 60 %
Plasma jet temperature	3500-6000 K	1800-5500 K

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