8. Exposure controls/personal protection

Occupational exposure limits

US. OSHA Table Z-1 Permissible Exposure Limits (PEL) for Air Contaminants (29 CFR 1910.1000)

Components	Type	Value
Dihydrogen hexafluorotitanate(2-) (CAS 17439-11-1)	PEL	2.5 mg/m3
Manganese orthophosphate (CAS 10124-54-6)	Ceiling	5 mg/m3
ORTHOPHOSPHORIC ACID (CAS 7664-38-2)	PEL	1 mg/m3

US. OSHA Table Z-2 Permissible Exposure Limits (PEL) (29 CFR 1910.1000)

Components	Type	Value	Form
Dihydrogen hexafluorotitanate(2-) (CAS 17439-11-1)	TWA	2.5 mg/m3	Dust.

US. ACGIH Threshold Limit Values (TLV)

Components	Type	Value	Form
Dihydrogen hexafluorotitanate(2-) (CAS 17439-11-1)	TWA	2.5 mg/m3	
Manganese orthophosphate (CAS 10124-54-6)	TWA	0.1 mg/m3	Inhalable fraction.
		0.02 mg/m3	Respirable fraction.
ORTHOPHOSPHORIC ACID (CAS 7664-38-2)	STEL	3 mg/m3	
	TWA	1 mg/m3	

NIOSH. Immediately Dangerous to Life or Health (IDLH) Values, as amended

Components	Type	Value
Manganese orthophosphate (CAS 10124-54-6)	IDLH	500 mg/m3
ORTHOPHOSPHORIC ACID (CAS 7664-38-2)	IDLH	1000 mg/m3

US. NIOSH: Pocket Guide to Chemical Hazards Recommended Exposure Limits (REL)

Components	Type	Value	Form
Dihydrogen hexafluorotitanate(2-) (CAS 17439-11-1)	TWA	2.5 mg/m3	
Manganese orthophosphate (CAS 10124-54-6)	STEL	3 mg/m3	Fume.
	TWA	1 mg/m3	Fume.
ORTHOPHOSPHORIC ACID (CAS 7664-38-2)	STEL	3 mg/m3	
	TWA	1 mg/m3	

Biological limit values

ACGIH Biological Exposure Indices (BEI)

Components	Value	Determinant	Specimen	Sampling Time
Dihydrogen hexafluorotitanate(2-) (CAS 17439-11-1)	3 mg/l	Fluoride	Urine	*
	2 mg/l	Fluoride	Urine	*

* - For sampling details, please see the source document.

Appropriate engineering controls

Provide eyewash station and safety shower. Use adequate ventilation to control airborne concentrations below the exposure limits/guidelines. If user operations generate a vapor, dust and/or mist, use process enclosure, appropriate local exhaust ventilation, or other engineering controls to control airborne levels below the recommended exposure limits/guidelines.