

# NANOACHEM®

## NANOACHEM® Purification Media

NANOACHEM® purification media have long been the industry standards for purifying inert gases, such as nitrogen, argon, and sulfur hexafluoride, as well as reactive gases, such as hydrogen, hydrocarbons, and hydride gases (including ammonia, silane, arsine and phosphine). Applications include biotech, chemical processing,

aerospace, analytical, petroleum refining, and semiconductor / compound semiconductor processes, including low temperature SiGe Epi, SiN and GaN MOCVD processes. Many different purification media are available to purify over 80 different gases.

### NANOACHEM® Gas Types Purification Summary Table

GASES PURIFIED	CHEMICAL FORMULA	PURIFICATION MEDIUM	PURIFICATION MEDIUM DESCRIPTION	IMPURITIES REMOVED	EFFICIENCY	END POINT DETECTION
<b>Inerts</b>						
<b>Nitrogen</b> <b>Argon</b> <b>Helium</b> <b>Xenon</b> <b>Krypton</b> <b>Neon</b>	N <sub>2</sub> Ar He Xe Kr Ne	INX	Reactive agents on an inorganic support	H <sub>2</sub> O, O <sub>2</sub> , CO, CO <sub>2</sub> H <sub>2</sub>	<100 ppt, LDL <1 ppb	DC only
		INX-Plus™	Reactive agents on an inorganic support	H <sub>2</sub> O, O <sub>2</sub> , CO, CO <sub>2</sub> H <sub>2</sub> C <sub>6</sub> H <sub>6</sub> C <sub>6</sub> H <sub>5</sub> CH <sub>3</sub> Ethylbenzene m,p-Xylene o-Xylene Refractories** THC except CH <sub>4</sub> Halocarbons except CF <sub>4</sub>	<100 ppt, LDL <1 ppb <156 ppq LDL <93 ppq LDL <96 ppq LDL <79 ppq LDL <112 ppq LDL <134 ppq LDL <1 ppt	DC only
		In2Go™	Reactive agents on an inorganic support	H <sub>2</sub> O, O <sub>2</sub> , CO, CO <sub>2</sub>	<100 ppt, LDL	DC only
		OMX-Plus™	Reactive agents on a polymeric support w/ inorganic agent for NMHC removal	H <sub>2</sub> O, O <sub>2</sub> , CO <sub>2</sub> , THC except CH <sub>4</sub> Halocarbons except CF <sub>4</sub> CO at Low Flow	<100 ppt, LDL <1 ppb	DC only
		HCX™	High surface area inorganic medium	Hydrocarbons except CH <sub>4</sub> Halocarbons except CF <sub>4</sub>	<100 ppt, LDL	Not available
<b>Flammables - Partial List</b>						
<b>Methane</b>	CH <sub>4</sub>	INX-Plus™	Reactive agents on an inorganic support	H <sub>2</sub> O, O <sub>2</sub> , CO, CO <sub>2</sub> H <sub>2</sub> C <sub>6</sub> H <sub>6</sub> C <sub>6</sub> H <sub>5</sub> CH <sub>3</sub> Ethylbenzene m,p-Xylene o-Xylene Refractories** THC except CH <sub>4</sub> Halocarbons except CF <sub>4</sub>	<100 ppt, LDL <1 ppb <156 ppq LDL <93 ppq LDL <96 ppq LDL <79 ppq LDL <112 ppq LDL <134 ppq LDL <1 ppt	DC only

GASES PURIFIED	CHEMICAL FORMULA	PURIFICATION MEDIUM	PURIFICATION MEDIUM DESCRIPTION	IMPURITIES REMOVED	EFFICIENCY	END POINT DETECTION
<b>Flammables - Partial List (continued)</b>						
<b>Methane Ethane Propane Butane</b>	CH C2H6 C3H8 C4H10	INX	Reactive agents on an inorganic support	H2O, O2, CO, CO2	<100 ppt, LDL	DC only
		In2Go™	Reactive agents on an inorganic support	H2O, O2, CO, CO2	<100 ppt, LDL	DC only
		OMX™	Reactive agents on a polymeric support	H2O, O2, CO2 CO at Low Flow	<100 ppt, LDL <1 ppb	DC only
<b>Hydrogen Deuterium</b>	H2 D2	INX	Reactive agents on an inorganic support	H2O, O2, CO, CO2	<100 ppt, LDL	DC only
		OMX-Plus™	Reactive agents on a polymeric support w/ inorganic agent for NMHC removal	H2O, O2, CO2, THC except CH4 Halocarbons except CF4	<100 ppt, LDL	DC only
				CO at Low Flow	<1 ppb	
		In2Go™	Reactive agents on an inorganic support	H2O, O2, CO, CO2	<100 ppt, LDL	DC only
		INX-Plus™	Reactive agents on an inorganic support	H2O, O2, CO, CO2 H2 C6H6 C6H5CH3 Ethylbenzene m,p-Xylene o-Xylene Refractories** THC except CH4 Halocarbons except CF4	<100 ppt, LDL <1 ppb <156 ppq LDL <93 ppq <211 ppq LDL <279 ppq <506 ppq LDL <134 ppq LDL <134 ppq LDL <1 ppt <1 ppt	DC only
HCX™	High surface area inorganic medium	Hydrocarbons except CH4 Halocarbons except CF4	<100 ppt, LDL	Not available		
<b>Cyclopropane</b>	C3H6	MSA	High surface area inorganic medium	H2O	<30 ppb, LDL	Not available

Please contact customer service for other flammables that can be purified.

<b>Halocarbons - Partial List</b>						
<b>Carbon Tetrafluoride (R 14)</b>	CF4	INX	Reactive agents on an inorganic support	H2O, O2, CO, CO2	<100 ppt, LDL	DC only
		OMX-Plus™	Reactive agents on a polymeric support w/ inorganic agent for NMHC removal	H2O, O2, CO2, THC except CH4 Halocarbons except CF4	<100 ppt, LDL	DC only
		INX-Plus™	Reactive agents on an inorganic support	H2O, O2, CO, CO2 H2 C6H6 C6H5CH3 Ethylbenzene m,p-Xylene o-Xylene TMDSO THC except CH4 Halocarbons except CF4	<100 ppt, LDL <1 ppb <156 ppq LDL <211 ppq <279 ppq LDL <506 ppq <363 ppq LDL <134 ppq LDL <1 ppt <1 ppt	DC only
<b>Chlorotrifluoromethane (Halocarbon-13)</b>	CCIF3	MSA	High surface area inorganic medium	H2O	<30 ppb, LDL	Not available
<b>Dichlorodifluoromethane (Halocarbon-12)</b>	CCI2F2	MSA	High surface area inorganic medium	H2O	<30 ppb, LDL	Not available
<b>Difluoromethane (R 32)</b>	CH2F2	MSA	High surface area inorganic medium	H2O	<30 ppb, LDL	Not available
<b>Perfluorobutane (Halocarbon-C610)</b>	C4F10	OMX™	Reactive agents on a polymeric support	H2O, O2, CO2	<100 ppt, LDL	DC only

Halocarbons - Partial List (continued)						
<b>Hexafluoroethane (Halocarbon-116)</b>	C2F6	OMX™	Reactive agents on a polymeric support	H2O, O2, CO2	<100 ppt, LDL	DC only
<b>Methyl Fluoride (Halocarbon-41)</b>	CH3F	MSA	High surface area inorganic medium	H2O	<30 ppb, LDL	Not available
<b>Perfluoropropane (Halocarbon-218)</b>	C3F8	OMX™	Reactive agents on a polymeric support	H2O, O2, CO2	<100 ppt, LDL	DC only
<b>Trichlorofluoromethane (Halocarbon-11)</b>	CCl3F	MSA	High surface area inorganic medium	H2O	<30 ppb, LDL	Not available
<b>Trichlorotrifluoroethane (Halocarbon-113)</b>	C2Cl3F3	MSA	High surface area inorganic medium	H2O	<30 ppb, LDL	Not available
<b>Perfluorobutane (Halocarbon-C610)</b>	C4F10	OMX™	Reactive agents on a polymeric support	H2O, O2, CO2	<100 ppt, LDL	DC only

Please contact customer service for other halocarbons that can be purified.

Hydrides						
<b>Ammonia</b>	NH3	In2Go™	Reactive agents on an inorganic support	H2O CO2 O2 GeH4 H2S SiH4 TEOS	<45 ppb, LDL <11 ppb, LDL <5 ppb, LDL <1 ppb, LDL <45 ppb, LDL <1 ppb, LDL <40 ppb, LDL	DC only
		OMA™	Reactive agents on a polymeric support	H2O, O2, CO2	<100 ppt, LDL	DC only
		PureLite	High surface area inorganic medium	H2O Hydrocarbons except CH4 n-Butane Ethylbenzene in gaseous NH3	<45 ppb <30 ppb <30 ppb <30 ppb	Not available
				Hydrocarbons except CH4 Ethylbenzene Napthanic and Paraffins in liquid NH3	<200 ppb 96% removal 85% removal	Not available
<b>Silane</b>	SiH4	OMX™	Reactive agents on a polymeric support	H2O, O2, CO2, CO	<100 ppt, LDL	DC only
<b>Monomethylsilane</b>	SiH3CH3	OMX™	Reactive agents on a polymeric support	H2O, O2, CO2, CO	<100 ppt, LDL	DC only
<b>Arsine</b>	AsH3	ASX-II™	High surface area inorganic medium	<75 ppb H2O in AsH3, LDL		Not available
		ASX-II XL	High surface area inorganic medium	<75 ppb H2O in AsH3, LDL		
<b>Phosphine</b>	PH3	PHX™	Reactive agents on an inorganic support	<33 ppb H2O in PH3, LDL		Not available
		PHX-II XL	High surface area inorganic medium	<75 ppb H2O in PH3, LDL		
<b>Germane</b>	GeH4	Desicore	High surface area inorganic medium	<5 ppb H2O in GeH4, LDL		Not available
Hydride/Inert Mixes						
<b>1-10% Arsine 1-10% Germane 1-10% Phosphine</b>	AsH3 GeH4 PH3	OMX™	Reactive agents on a polymeric support medium	H2O, O2, CO2	<1 ppb	Not available

GASES PURIFIED	CHEMICAL FORMULA	PURIFICATION MEDIUM	PURIFICATION MEDIUM DESCRIPTION	IMPURITIES REMOVED	EFFICIENCY	END POINT DETECTION
<b>Corrosives</b>						
<b>Boron Trichloride Chlorine Trichlorosilane Dichlorosilane Hydrogen Bromide</b>	BCl <sub>3</sub> Cl <sub>2</sub> SiHCl <sub>3</sub> SiH <sub>2</sub> Cl <sub>2</sub> HBr	Metal-X™	High purity high surface area inorganic medium	H <sub>2</sub> O <100 ppb, LDL Volatile Metals-Fe, Mo, Cr, Ti, Ni, Mn*		Not available
			High purity high surface area inorganic medium			
<b>Hydrogen Chloride</b>	HCl		High purity high surface area inorganic medium	H <sub>2</sub> O <100 ppb, LDL Volatile Metals-Fe, Mo, Cr, Ti, Ni, Mn*		Not available
<b>Hydrogen Fluoride</b>	HF	CleanCorr™	High surface area inorganic medium	H <sub>2</sub> O <3 ppm, LDL B, Mg, Al, Zn, Zr, W, Fe <2 ppbw		Not available
<b>Others</b>						
<b>Carbon Monoxide Nitric Oxide</b>	CO NO	Metal-X™	High purity high surface area inorganic medium	H <sub>2</sub> O <100 ppb, LDL Fe(CO) <sub>5</sub> <50 ppb Volatile Metals-Fe, Mo, Cr, Ti, Ni, Mn*		Not available
<b>Carbon Dioxide Nitrous Oxide</b>	CO <sub>2</sub> N <sub>2</sub> O	HCX™	High surface area inorganic medium	Isopropyl Alcohol Acetone Propene Ethanol Carbon Disulfide Hexane Benzene Heptane Toluene m,p-Xylene o-Xylene Ethyl Toluene 1,3,5-Trimethyl Benzene 1,2,4-Trimethyl Benzene Dichloro Benzene Halocarbons except CF <sub>4</sub>	<0.2 pp <0.093 ppb <0.001 ppb <0.001 ppb <0.001 ppb <0.001 ppb <0.001 ppb <0.001 ppb <0.001 ppb <0.001 ppb <0.001 ppb <0.001 ppb <0.001 ppb <0.001 ppb <0.001 ppb <100 ppt, LDL	Not available
		MSA	High surface area inorganic medium	H <sub>2</sub> O	<15 ppb	Not available
<b>Oxygen</b>	O <sub>2</sub>	OPX™	High surface area inorganic medium	H <sub>2</sub> O	<2 ppb	Not available
		MSA	High surface area inorganic medium	H <sub>2</sub> O	<15 ppb	Not available
<b>Dimethyl Ether</b>	(CH <sub>3</sub> ) <sub>2</sub> O	OMX™ (55 ml or less)	Reactive agents on a polymeric support	H <sub>2</sub> O, O <sub>2</sub> , CO <sub>2</sub>	<100 ppt, LDL	Not available
		OPX™	High surface area inorganic medium	H <sub>2</sub> O	<10 ppb as measured in CO <sub>2</sub> and N <sub>2</sub> O	Not available
<b>Sulfur Hexafluoride</b>	SF <sub>6</sub>	OMS™	Reactive agents on a polymeric support	H <sub>2</sub> O, O <sub>2</sub>	<10 ppb, LDL	DC only
<b>Acetylene</b>	C <sub>2</sub> H <sub>2</sub>	AcetyClean	High surface area inorganic medium	H <sub>2</sub> O	<1 ppm, LDL	Not available
<b>Clean Dry Air</b>		OPX™	High surface area inorganic medium	H <sub>2</sub> O	<2 ppb	Not available
		MSA	High surface area inorganic medium	H <sub>2</sub> O	<15 ppb	Not available

ppm = part per million  
ppb = part per billion  
ppt = part per trillion  
ppq = part per quadrillion

THC = Total Hydrocarbons  
LDL = Lower Limit of Detection by state-of-the-art analytical instrumentation.  
\*Nippon Sanso Matheson does not guarantee removal of volatile metals  
\*\*Refractories as TMDSO (Tetramethyldisiloxane)

Please contact customer service for other gases not included in this list.

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