

SEMI C3.54-0200^E (Withdrawn 1011) GAS PURITY GUIDELINE FOR SILANE

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NOTICE: This Document was balloted and approved for withdrawal in 2011.

1 Description

1.1 Silane (SiH₄) is a pyrophoric, flammable colorless gas.

2 Specifications

2.1 Quality: 99.994%

<i>Impurities</i>	<i>Maximum Acceptable Level (ppm)</i>
Arsine (AsH ₃)	1 ppb
Carbon Monoxide (CO)	0.1
Carbon Dioxide (CO ₂)	0.1
Chlorosilanes (ionizable chlorides) including HCl, reported as chloride (Cl ⁻)	1
Non-methane Hydrocarbons (C ₂ -C ₄)	0.1 total
Hydrogen (H ₂)	50
Methane (CH ₄)	0.1
Nitrogen (N ₂)	1
Phosphine (PH ₃)	0.1 ppb
Disiloxane (H ₃ SiOSiH ₃)	1
Methyl Silane (SiH ₃ -CH ₃)	1
Disilane (Si ₂ H ₆)	1
Aluminum (Al)	0.2 ppba ^{#2}
Antimony (Sb)	0.2 ppba ^{#2}
Arsenic (As)	0.2 ppba ^{#2}
Boron (B)	0.02 ppba ^{#2}
Gallium (Ga)	0.2 ppba ^{#2}
Phosphorus (P)	0.02 ppba ^{#2}
Calcium (Ca) + Chromium (Cr) + Copper (Cu) + Iron (Fe) + Potassium (K) + Lithium (Li) + Magnesium (Mg) + Manganese (Mn) + Molybdenum (Mo) + Sodium (Na) + Nickel (Ni) + Lead (Pb) + Zinc (Zn)	1.0 ppba total ^{#2}
Water (H ₂ O) (vol/vol)	1
Particles	#1
TOTAL SPECIFIED IMPURITIES	56.4033

#1 To be determined between supplier and user.

#2 ppba is defined to be atoms of impurity per 10⁹ atoms of silicon.

3 Electrical Specification

3.1 *Resistivity* — Greater than 10,000 ohm-cm (*n*-type).

4 Physical Constants

	<i>Metric Units</i>	<i>US Units</i>
Molecular weight	32.112	32.112
Boiling point at 1 atm.	−112°C	−169.6°F
Density of gas at 21.1°C (70°F) and 1 atm.	1.342 kg/m ³	0.0839 lb/ft ³
Specific gravity of gas at 21.1°C and 1 atm. (air = 1)	1.114	1.114
Density of liquid at boiling point.	711 kg/m ³	44.39 lb/ft ³

5 Procedures (See NOTE 1)

NOTE 1: Standardized test methods are being developed for all parameters at the purity level indicated. Until standardized test methods are published, test methodology shall be determined by user and producer.

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