



AMMONIA SOLUTION

CERTIFICATE OF ANALYSIS

PRODUCT NUMBER: S010701

LOT NUMBER: 7111040

RELEASE DATE: May, 2011

EXPIRY DATE: May, 2014

NH₃ (20 - 22%): Properties

Molar Mass: 17.03g/mol

Density: 0.92 g/ml

Molarity: 11 moles/litre

Normality: 11 moles/litre

Tests	Maximum Specification	Actual Value	Units
ASSAY (NH ₃ , w/w):	20 - 22%	21%	% by w/w
Colour:	10	< 10	APHA

Analyte	Maximum Specification	Actual Value (in ppb)	Analyte	Maximum Specification	Actual Value (in ppb)
Aluminum (Al)	1 ppb	< 0.5	Neodymium (Nd)	0.1 ppb	< 0.1
Antimony (Sb)	0.5 ppb	< 0.1	Nickel (Ni)	0.5 ppb	< 0.2
Arsenic (As)	1 ppb	< 0.1	Niobium (Nb)	0.1 ppb	< 0.1
Barium (Ba)	0.1 ppb	< 0.1	Palladium (Pd)	Information Only	< 1
Beryllium (Be)	0.1 ppb	< 0.1	Platinum (Pt)	Information Only	< 1
Bismuth (Bi)	0.1 ppb	< 0.1	Potassium (K)	1 ppb	< 0.2
Cadmium (Cd)	0.5 ppb	< 0.1	Praseodymium (Pr)	0.1 ppb	< 0.1
Calcium (Ca)	1 ppb	< 0.5	Rhenium (Re)	Information Only	< 1
Cerium (Ce)	0.1 ppb	< 0.1	Rhodium (Rh)	0.5 ppb	< 0.1
Cesium (Cs)	0.1 ppb	< 0.1	Rubidium (Rb)	0.1 ppb	< 0.1
Chromium (Cr)	0.5 ppb	< 0.1	Ruthenium (Ru)	Information Only	< 1
Cobalt (Co)	0.5 ppb	< 0.1	Samarium (Sm)	0.1 ppb	< 0.1
Copper (Cu)	0.5 ppb	< 0.5	Scandium (Sc)	0.1 ppb	< 0.1
Dysprosium (Dy)	0.1 ppb	< 0.1	Selenium (Se)	1 ppb	< 0.1
Erbium (Er)	0.1 ppb	< 0.1	Silver (Ag)	0.5 ppb	< 0.1
Europium (Eu)	0.1 ppb	< 0.1	Sodium (Na)	1 ppb	< 1
Gadolinium (Gd)	0.1 ppb	< 0.1	Strontium (Sr)	0.1 ppb	< 0.1
Gallium (Ga)	0.1 ppb	< 0.1	Tellurium (Te)	0.1 ppb	< 0.1
Germanium (Ge)	0.1 ppb	< 0.1	Terbium (Tb)	0.1 ppb	< 0.1
Gold (Au)	0.5 ppb	< 0.1	Thallium (Tl)	0.1 ppb	< 0.1
Hafnium (Hf)	Information Only	< 0.5	Thorium (Th)	0.1 ppb	< 0.1
Holmium (Ho)	0.1 ppb	< 0.1	Thulium (Tm)	0.1 ppb	< 0.1
Indium (In)	0.1 ppb	< 0.1	Tin (Sn)	0.5 ppb	< 0.1
Iron (Fe)	1 ppb	< 0.5	Titanium (Ti)	0.5 ppb	< 0.1
Lanthanum (La)	0.1 ppb	< 0.1	Tungsten (W)	0.1 ppb	< 0.1
Lead (Pb)	0.1 ppb	< 0.1	Uranium (U)	0.1 ppb	< 0.1
Lithium (Li)	0.1 ppb	< 0.1	Vanadium (V)	0.5 ppb	< 0.1
Lutetium (Lu)	0.1 ppb	< 0.1	Ytterbium (Yb)	0.1 ppb	< 0.1
Magnesium (Mg)	1 ppb	< 0.2	Yttrium (Y)	0.1 ppb	< 0.1
Manganese (Mn)	0.5 ppb	< 0.2	Zinc (Zn)	0.5 ppb	< 0.5
Mercury (Hg)	0.2 ppb	< 0.2	Zirconium (Zr)	0.1 ppb	< 0.1
Molybdenum (Mo)	0.5 ppb	< 0.1			

Analyte	Maximum Specification	Actual Value (in ppm)	Analyte	Maximum Specification	Actual Value (in ppm)
Chloride (Cl ⁻)	0.5 ppm	< 0.5	Sulphate (SO ₄ ²⁻)	1 ppm	< 1
Phosphate (PO ₄ ³⁻)	0.01 ppm	< 0.01			

Element concentrations are at the point of bottling.


 Dr. B. McKelvey
 QA/QC Manager

 **SEASTAR CHEMICALS INC**
 A member of the AXYS Group

10005 McDonald Park Road, Sidney, BC V8L 5Y2 Canada
 Phone: 250-655-5880 - Fax: 250-655-5888 - Toll Free: 1-800-663-2330
 www.seastarchemicals.com