

**PRODUCT NUMBER: S010201**

**LOT NUMBER: 2112110**

**RELEASE DATE: February, 2014**

**EXPIRY DATE: February, 2017**

## CERTIFICATE OF ANALYSIS

| Tests                            | Maximum Specification | Actual Value | Units    |
|----------------------------------|-----------------------|--------------|----------|
| ASSAY (HClO <sub>4</sub> , w/w): | 65 - 71%              | 68%          | % by w/w |
| Colour:                          | 10                    | < 10         | APHA     |

| HClO <sub>4</sub> (67 - 71%): | Properties     |
|-------------------------------|----------------|
| Molar Mass:                   | 100.46g/mol    |
| Density:                      | 1.67 g/ml      |
| Molarity:                     | 12 moles/litre |
| Normality:                    | 12 moles/litre |

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

Element concentrations are at the point of bottling. Concentrations of some elements in particular, Ca, Si, K, Na, B, Al, Mg & Mn will increase due to storage in glass bottles.

  
Dr. B. McKelvey  
QA/QC Manager



**SEASTAR CHEMICALS INC**

A member of the AXYS Group

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