



AMMONIA SOLUTION

CERTIFICATE OF ANALYSIS

PRODUCT NUMBER: S010701

LOT NUMBER: 7110060

RELEASE DATE: June, 2010

EXPIRY DATE: June, 2013

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% | 20% | % 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.

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