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MSDS: LOW VISCOSITY POLYTUNGSTATE

Low viscosity POLYTUNGSTATE also called "LVP" is a new component in the production of heavy solutions. It brings a number of advantages with it when compared to Zinc-Chloride solutions or highly toxic halogenous hydrocarbons used in Sink or Swim analysis. LVP has a low viscosity at high density and an excellent thermal stability. This material is a good completion to the standard Sodium Polytungstate.

FORMULA: Alkali $(Y_nW_{12}O_{40})^{6-}$

APPEARANCE: white crystals or light yellow-brown, transparent solution

PROPERTIES: well soluble in water, pH-neutral solution, maximum attainable solution density 3,0 g/cm^3 at 25°C

ADVANTAGES:
Non-toxic
Nonflammable
Non-odorous
Working under an extractor unnecessary
Excellent thermal stability
Reusable
Density may be regulated with water from density 1,1 – 3,0 g/cm^3
Low viscosity at high density
Easy to handle
The sink or swim material is extremely easy to clean with water
Ecologically friendly

APPLICATIONS: The dense solution is produced by dissolving sodium-poly-tungstate in deionised water.
In this association, one is dealing with an extremely water soluble sat. The maximum attainable solution density at room temperature is 3,0 g/cm^3. Further chemo-physical details may be read from both diagrams, which illustrate density as a function of "Low viscosity Polytungstate" (Fig.1). Viscosity as a function of density (Fig.2). Separation is therefore possible even in the fine-particle realm. In areas of higher density it is not necessary to use a laboratory centrifuge.
Moreover, the solution may be reused after filtration. The used solution need then only be heated to a temperature of ‹95°C and reduced to achieve the desired density. LVP has an excellent thermal stability. Complete dehydration must be avoided.

STRUCTURE: It is a 12-fold aggregated iso-polytungstate with a molar mass of ›2986 g/mol.
According to models, Polytungstate is built up of octohedrons in which the oxygen ions are to be found on the corners and the tungsten ions in the center of octohedron. When represented as a spherical model, the oxygen ions comprise a dense spherical shell in which the tungstate ions fill the open spaces in the octohedron.
So composed, one may consider this a "true" meta-tungstate, structurally represented as $X_n(Y_2W_{12}O_{40})$. It is known of true meta-tungstate that both of the oxygen atoms are to be found in the central cavity of the polyanions and are incapable of transcending the spherical casing.

DIRECTIONS: Solid crystalline Low viscosity Polytungstate is anhydrous and has an unlimited shelf life at room temperature.
Please note the following when using aqueous poly-tungstate solution:

a) Use only distilled or demineralised water
b) Close all vessels properly after use
c) Use only glass, synthetic or stainless-steel vessels
d) Do not bring the solution into contact with reduced materials. In such cases the resultant blue coloring will not have any effect on the pre-set density. A few drops of hydrogen peroxide will remove or prevent the solution from turning blue.
e) The sink or swim material should not contain any water soluble ions. In particular Pb^{2+}, Ag^{+}, Sn^{2+}, and Ba^{2+} ions lead to the formation of insoluble precipitations of Polytungstate. Should soluble ions be present in the material, it should be washed beforehand in hot water.

ANALYSIS: Low viscosity Polytungstate contains a minimus of 86± 1% WO_3. The amount of water bound in Low viscosity Polytungstate may deviate marginally.
Typical analysis results (no guarantee):
Al ‹0,0015%; As ‹0,012%; Bi ‹0,0005%; Ca ‹0,008%; Mg ‹0,0015%
Cu ‹0,001%; Fe ‹0,008%; Mn ‹0,001%; Mo ‹0,02%; Ni ‹0,001%
P ‹0,005%; Pb ‹0,0005%; S ‹0,0004%; Sb ‹0,001%; Si ‹0,005%;
Sn ‹0,0005%; Ti ‹0,001; V ‹0,001%;

SUPPLY FORM: Low viscosity Polytungstate is usually supplied as an instantly usable aqueous solution with a density of 2.82± 0,02 g/cm³ in 1 kg, 5 kg and 10 kg units.

TOXICOLOGY: Generally all tungsten compounds are considered non-toxic (cf. "Metal Toxicity in Mammals - 2", Chemical Toxicity of Metals and Metalloids by B. Venugopal and T.D. Luckey, Department of Biochemistry, University of Missouri, Columbia 1978, as well as Handbook on the Toxicology of Metals, Chapter 39, by L. Fridberg, G.F. Nordberg and V.B. Vouk, ElsevierlNorth Holland Biochemical Press (1979)).
Further, tungsten is not mentioned in the pharmacological textbook by Bader, in which the whole spectrum of toxic heavy metals is listed.

Low viscosity Polytungstate is not yet fully tested.
For the flrst we use the following datas:
LD50 oral, Rat = 1715 mg/kg; LD50 dermal, Rat = › 2000 mg/kg.
Low viscosity Polytungstate will not lead to skin irritation or skin sensibility.
Crystallised Low viscosity Polytungstate should not come into eye contact (eye irritation).
Further information is provided in the enclosed Safety Information Sheet.

Figure 1

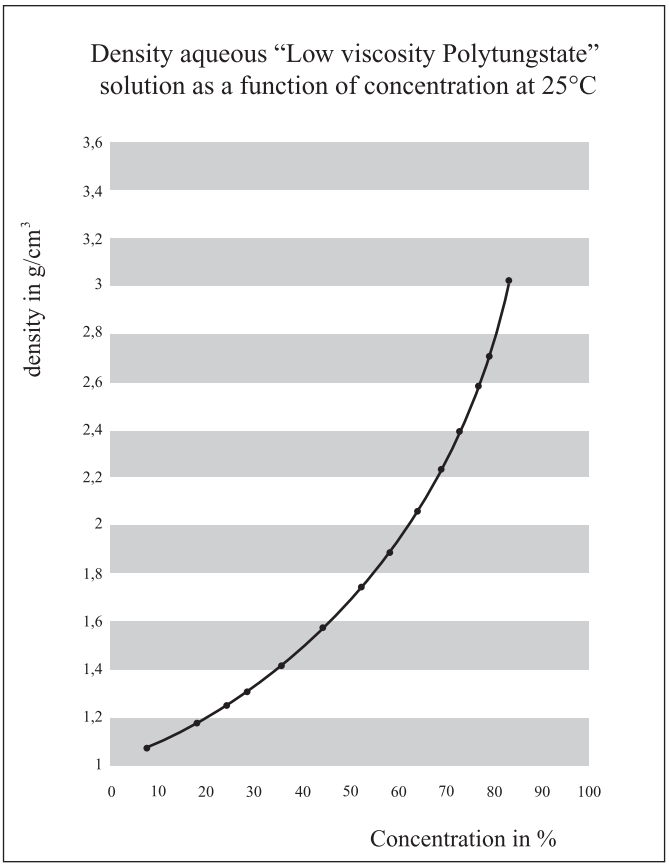

Figure 2