LST Fastfloat

Heavy liquid for rapid density separation of minerals

Laboratory safety is on everyone's mind, but no-one wants to give up the convenience of a fast effective liquid. With LST Fastfloat you can have both.

Old heavy liquids were disagreeable to work with, posed hazards to health and carried environmental risks. With LST Fastfloat you no longer need fume cupboards, and you can still get high throughput and convenience.

LST Fastfloat is an aqueous solution of low toxicity which enables rapid and effective mineral separations. LST heavy liquids have been developed as safe and effective replacements for bromoform and TBE. LST Fastfloat has the lowest viscosity of any water-based heavy liquid. It also has high thermal stability and an operating density of over 2.90 g/mL at 25°C.

2000 National Safety and Health INNOVATION AWARDS

Safety Award

Rio Tinto Exploration Pty Ltd and Iluka Resources Ltd were highly commended at the Year 2000 Australian National Safety and Health Innovation Awards for substituting low toxicity LST heavy liquids for tetrabromoethane and bromoform used in mineral float and sink separations.

- **low toxicity**
- **fast separation**
- **fast filtration**
- **stable and reusable**
- **cost effective**

geology
research
palaeontology
industrial minerals

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LST Fastfloat Specifications

Physical Characteristics

LST Fastfloat contains 80% sodium heteropolytungstates in the form of extremely soluble, colourless, hydrated crystals. Concentrated water solutions of LST Fastfloat form colourless or pale yellow heavy liquids.

Safety

Heteropolytungstate heavy liquids have much lower toxicity than organic heavy liquids. LST Fastfloat is supplied and used in a safe water solution. LST Fastfloat is not volatile and contains no solvents, so fume cupboards are not required.

Thermal Stability

The high thermal stability of LST Fastfloat allows it to be boiled to evaporate water and regain its original high density. This means that recycling is rapid, simple and effective.

Operating Density

At 25°C LST Fastfloat can be used at any density up to 2.9 g/mL by diluting with water or by concentrating to remove water. LST Fastfloat is supplied at a density of 2.82 g/mL which minimises the likelihood of crystallisation which may occur at the maximum density.

With no evaporation or crystallisation, the density of LST heavy liquid changes by only 0.01 g/ml per 10 degrees C. To deliberately change the density of LST Fastfloat, water must be added or evaporated. At higher temperatures, water can be evaporated to produce densities up to 3.3 g/mL.

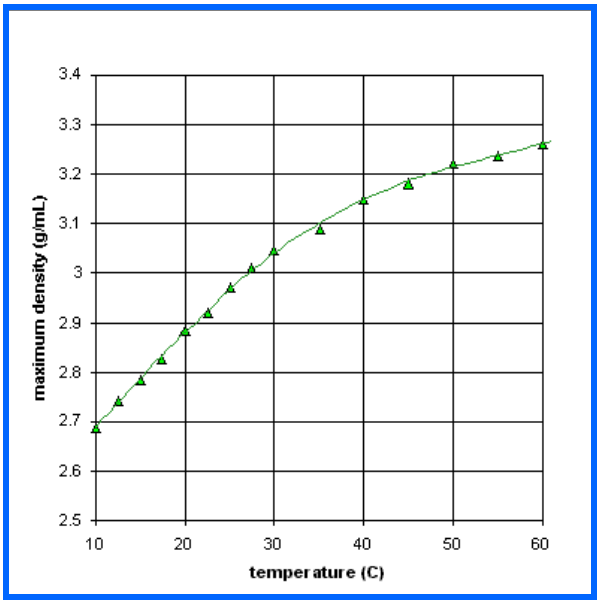

Figure 1: Maximum LST Fastfloat Density (after water is added or removed)

Viscosity

Low viscosity is a feature of LST heavy liquids. The viscosity of LST Fastfloat varies with density and temperature, but at typical temperatures and densities is about 10 cP. This is comparable with TBE, and allows rapid separations.

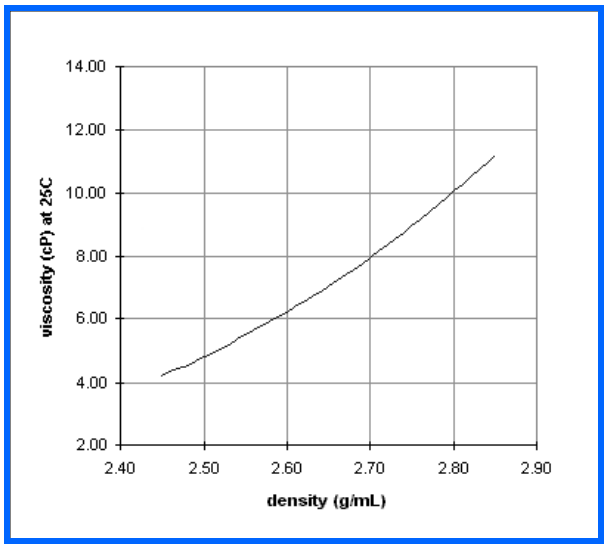

Figure 2: Viscosity vs Density for LST Fastfloat

Storage and Use

LST Fastfloat can be stored indefinitely in closed plastic or glass containers. LST Fastfloat reacts with many metals, so contact with metals should be avoided during storage and heavy liquid separations. If subject to very cold conditions, crystals may appear, but will dissolve again when the heavy liquid is warmed

Recycling

LST Fastfloat can be recovered quite easily by firstly washing the separated minerals with deionised water, filtering, and then concentrating the water washings by evaporation through boiling. The LST Fastfloat is not volatile so it is concentrated as the water evaporates. In this way, LST Fastfloat can be recycled with greater than 99% efficiency. The recovery of LST Fastfloat is high by this method. Typically, only 1.5 mL per kilogram of mineral sample of LST Fastfloat is lost with general usage.

For further information

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