



"Suppliers of Ferrofluids for Research and Industry"

Ferrofluids for Sink Float Separation

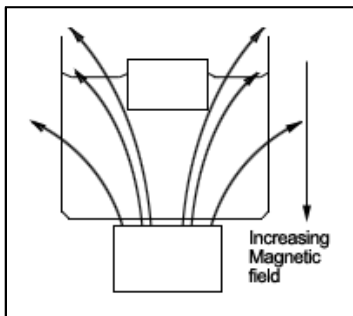
Ferrofluids

Ferrofluids are stable colloidal dispersions of single domain magnetic particles, typically 100Å in diameter. The particles are usually Fe₃O₄ (magnetite) and are held in suspension by the use of dispersing agents which are compatible with both the carrier fluid and the magnetic particles. The carrier fluid is usually water or a hydrocarbon oil.

Ferrofluids for Separation Work

The importance of recovering resources from waste materials is an important and pressing problem. The rapid and inexpensive recovery of non-ferrous metals from solid wastes such as automobiles, electrical appliances or indeed any solid waste enables one not only to recycle valuable materials but also to benefit the environment.

The system used for sink-float separations consists of an electromagnet, separation chambers and the means to recover or remove the magnetic fluid coating the recovered materials.



By simply increasing the current in an electromagnet, arranged to produce a field gradient, it is possible to levitate materials of increasing densities to the surface of the magnetic fluid in a systematic way, thereby facilitating separation and recovery. For example a mixture of metals, such as lead, copper, zinc and aluminium having a wide range of densities can be separated and recovered. The principle behind the process, is that the presence of a field gradient imparts a force $VM\nabla H$ to the scrap

fragments (V is volume, M magnetisation of the fluid and ∇H the magnetic field gradient) which produces levitation thereby overcoming gravitational sedimentation.

The concentration of the ferrite particles is approximately 10 volume % thereby having a saturation magnetisation of 400 Gauss.

Health and Safety

Ferrofluids are not classed as hazardous materials. Normal laboratory health and safety procedures should be practised when handling any ferrofluid. Rubber or latex gloves and goggles should be worn. In case of contact with skin the affected area should be washed with mild soap and water. In case of eye contact, the eyes should be flushed with plenty of clean water for 15 minutes. All our ferrofluids are supplied with a safety sheet.

Ordering Information

<u>Water based</u>	<u>Ms (Gauss)</u>	<u>Particle diameter (nm)</u>	<u>Viscosity (cp)</u>
WHKS1S9-A	200	10	< 50
WHKS1S9-B	300	10	< 50
WHKS1S9-C	400	10	< 50

<u>Water based</u>	<u>Ms (Gauss)</u>	<u>Particle size (nm)</u>	<u>Viscosity (cp)</u>
WHJS1-A	200	10	< 5
WHJS1-B	400	10	< 10
WHJS1-C	600	10	< 30

If the above fluids do not meet with your requirements please do not hesitate to contact us so that a fluid to your specification can be formulated. Quotations provided via fax or email usually within 48 hours. We are happy to discuss licensing terms for scale up purposes at a substantial cost reduction.

For further information please contact our technical department at the address below.

LIQUIDS RESEARCH LIMITED
UNIT 3B MENTEC DEINIOL ROAD BANGOR GWYNEDD LL57 2UP UK
TEL: +44(0)1248 352204 / 354103 FAX: +44(0)1248 352204 / 352497
Email: mail@liquidsresearch.com Web:<http://www.liquidsresearch.com>