

New Folder Name Surface Tension

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TO Marty Tellalian
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FROM Larry K. Jones
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Copy of e-mail of Rai's surface tension measurements; no decision yet on Mirachem concentration.

From weiss@tristan.mit.edu Wed Nov 2 23:07:11 1994

To: ljones@ligo.caltech.edu

Cc: gerry@ligo.caltech.edu, lazz@ligo.caltech.edu

Subject: surface tension data

file:surfaceten110394.txt

to: L. Jones

from: R. Weiss Nov 3, 1994

concerning: Surface tension measurements

Larry,

I measured the surface tension of various liquids on the oxidized steel by measuring the derivative of the force with height as I moved the steel plate out of the liquid. The contact length of the fluid with the plate was 13.8 cm. The surface tension is monotonic but not linear in the derivative.

The results with the scale good to 0.1 grams were:

fluid	derivative gms/mm
Pure water	$2.98 \pm 0.1 \times 10^{-1}$
Propanol	$2.57 \pm 0.1 \times 10^{-1}$
5% Mirachem	$2.71 \pm 0.1 \times 10^{-1}$
50% Mirachem	$2.50 \pm 0.1 \times 10^{-1}$
100% Mirachem	$2.40 \pm 0.1 \times 10^{-1}$

The measurements were limited by the mass scale precision.

The data indicates that if one would like to make the surface tension of the Mirachem close to that of the propanol one should use a higher concentration of mirachem to water than 5% probably around 30 to 40%.

The mirachem seems to reduce the surface tension of the water monotonically, there is no minimum.

I am not ready to recommend such a high concentration since I expect that it will be very difficult to do the flushing. I will call the Mirachem company in the morning about these measurements and ask them what they recommend to reduce the surface tension in smaller concentrations.

RW