

NEUTRON STUDIES
OF THE STRUCTURE OF NON-POLAR MAGNETIC
FLUIDS WITH SURFACTANT EXCESS

*L.A. Bulavin¹, A.V. Nagornyi^{1,2}, V.I. Petrenko^{1,2},
M.V. Avdeev², L. Almásy³, L. Rosta³, V.L. Aksenov^{4,2}*

¹Taras Shevchenko National University of Kyiv,
Faculty of Physics
(2, *Prosp. Academician Glushkov, Kyiv 03022, Ukraine*),

²Joint Institute for Nuclear Research
(6, *Joliot-Curie Str., Dubna 141980, Russia*;
e-mail: avnagornyi@jinr.ru),

³Institute for Solid State Physics and Optics,
Wigner Research Centre for Physics,
Hungarian Academy of Sciences
(29-33, *Konkoly Thege Mikly's út.,
Budapest H-1525, Hungary*),

⁴B.P. Konstantinov Petersburg Nuclear Physics Institute
(*Orlova Roscha, Gatchina 188300,
Leningrad district, Russia*)

S u m m a r y

Non-polar magnetic fluid systems with an excess of surfactants have been studied with the use of the small-angle neutron scattering technique. Two types of highly stable ferrofluids, magnetite/oleic acid/decalin and magnetite/myristic acid/decalin, with a low (of about 1 vol.%) magnetite content and various acid fractions (up to 25 vol.%) are examined. The aggregation of magnetic particles and surfactant molecules is shown not to occur in the indicated concentration range of the acid molecule excess. The experimental results testify to a change of the interaction between the molecules of oleic and myristic acids in the free (non-adsorbed) state, when they are dissolved in magnetic fluids, and in their solutions in decalin without magnetic particles.