

**Polymorphic Transitions in eEven Paraffins $n\text{-C}_{24}\text{H}_{50} \div n\text{-C}_{34}\text{H}_{70}$.
X-ray and Spectral Studies**

Galyna Puchkovska^a, I. Gnatyuk^a, E. Kotelnikova^b, N. Platonova^b,
S. Filatov^b, ^a*Institute of Physics of National Academy of Sciences of
Ukraine, 46 pr. Nauki, Kyiv 03022, UKRAINE.* ^b *St. Petersburg State
University, 7/9 Universitetskaya Naberezhnaya, St. Petersburg,
RUSSIA.* E-mail: puchkov@iop.kiev

Polymorphic transitions in even n -paraffins ($n\text{C}_{24}\text{H}_{50} \div n\text{C}_{34}\text{H}_{70}$) were investigated by X-ray diffraction and IR spectroscopy at 20-70°C. Such phase transitions were studied for paraffins with $n \leq 24$ before [1]. Effects of our samples thermal prehistory on the sequence of phase transitions were considered. Different “rotator” phases were found for all studied paraffins: O_{rot1} , O_{rot2} , M_{rot1} , H_{rot} . IR spectra temperature dependencies showed, that up to T_{melt} paraffin molecules are in the completely extended *trans*-configuration. Davydov splitting value of deformation vibrations of methylene chains is characteristic for intermolecular interactions in the monoclinic paraffins. This value sharply decreases in the region of “rotator” phases existence and equals to zero in H_{rot} . A statistic and dynamic model was proposed, which provides an adequate description of the observed effect [2].

[1] Kotelnikova E. N., Filatov S. K., *Krystalokhimiya paraffins*, ed. “Neva” Zhurnal, St-Petersburg, 2002, 351. [2] Puchkovska G., Danchuk V., Kravchuk A., *J. Mol. Struct.*, 2004, **704**, 119.

Keywords: n -paraffins, polymorphism, x-ray - FTIR