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Low-melting phthalonitrile thermosetting monomers with siloxane- and phosphate bridges.

B.A. Bulgakov¹, A.V. Babkin¹, P.B. Dzhevakov², A.A. Bogolyubov², A.V. Sulimov³, A.V. Kepman^{1,2}, Yu. G. Kolyagin¹, D. V. Guseva⁴, V.Yu. Rudyak⁴, A.V. Chertovich⁴

¹ Lomonosov Moscow State University, Department of Chemistry, 119991, Leninskie Gory, 1-3, Moscow, Russia.

² Institute of new carbon materials and technology (INCMaT), 119991, Leninskie gory, 1-11, Moscow, Russia.

³ Lomonosov Moscow State University, Faculty of Materials Science, 119991, Leninskie Gory, 1-73, Moscow, Russia.

⁴ Lomonosov Moscow State University, Faculty of Physics, 119991, Leninskie Gory, 1-2, Moscow, Russia.

Abstract

The series of low-melting siloxane- and phosphate-bridged phthalonitriles are studied. The monomers of this type possess glass transition temperatures more than 100 °C lower than for common phthalonitriles. Based on the collected experimental data molecular dynamics simulations aimed to predict glass-transition temperatures of the considered types of low-melting phthalonitriles is reported. The validity of computational model is confirmed by successful synthesis of the new monomers, e.g. phosphate-bridged phthalonitriles is introduced for a first time. Cured Bis(3-(3,4-dicyanophenoxy)phenyl) phenyl phosphate demonstrates thermal performance featured to phthalonitriles (HDT ~450 °C, T_{5%} = 524 °C, Y_c, (Ar) = 80%)) along

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