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By-products of oil fractions pyrolysis as a raw material for the production of reactive resins

Michael Bratychak
Lviv Polytechnic National University, Ukraine

Pyrolysis of oil fractions, namely of petrol and gas oils, as well as of gaseous hydrocarbons with the aim of ethylene production, is one of the widely used processes in the oil refinery. Besides ethylene and propylene a series of by-products are formed during pyrolysis, including liquid products, so-called C9 fraction. Its yield is 20-25 wt % depending on the composition of the initial raw material and pyrolysis conditions. The C9 fraction consists of 50-65 (wt %) of unsaturated compounds such as styrene (15-27 %), vinyltoluenes and dicyclopentadienes (5-20 %), indene (5-20 %), methylstyrene (2-5 %) and others. The sufficiently high content of unsaturated compounds in the C9 fraction allows using this fraction for the production of so-called petroleum resins. They are formed via thermal, catalytic and initiating polymerization of unsaturated compounds. The methods of reactive resins production from the C9 fraction were developed at Petroleum Chemistry and Technology Department of Lviv Polytechnic National University. The resins contain epoxy, hydroxyl, carboxy, peroxy and other functional groups in their structure. The functionalized aliphatic compounds and peroxides were used as the initiators of radical polymerization of unsaturated compounds. We suggest to use the synthesized resins as additives to the polymeric compositions, as well as for the production of bitumen-polymeric mixtures.

Biography

Michael Bratychak has completed his Ph.D. in 1980 and D.Sc (in chemical sciences) in 1990 from Lviv Polytechnic National University. He is the Head of Petroleum Chemistry and Technology Department of the same University from 1994. He has published about 10 books, 420 scientific publications in Ukrainian, American, Polish, Czech and Russian journals; 52 Patents & Author's Certificates. Advisor to 32 works for Master degree, 18 for Ph.D. thesis and 2 for Doctoral thesis. Since 1996 he is an Academician of Ukrainian Oil and Gas Academy (UOGA) and Head of the Division of Petrochemistry of UOGA. He is the Editor-in-Chief of the journal Chemistry & Chemical Technology (in English), member of Programming Board of the "Ecological Chemistry and Engineering" journal (in Polish) and "Coal Chemistry" (in Ukrainian).

mbratych@polynet.lviv.ua