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THE USAGE OF POLYMERIC PETROLIUM RESINS

KATSIARYNA STELMAKH, ALENA KORBUT, SERGEY IAKUBOVSKIY
Polotsk State University, Belarus

In this article the usage of polymeric petroleum resins is revealed. We understand polymeric petroleum resins as a special class of low molecular weight synthetic resins which are derived from petroleum feedstocks. Sometimes these resins are also called petroleum hydrocarbon resins.

The production of polymeric petroleum resins began to develop on the basis coke chemistry and is closely related to the production of coumarone-indene resins, the history of which dates approximately one hundred years back. Because of the lack of feedstock for production of coumarone-indene resins, used instead of natural producrs, polymeric petroleum resins were created on the basis of cheap and available materials. Development of ethylene-propylene production contributed greatly to the creation of polymeric petroleum resins, as it provides significant resources of liquid pyrolysis products [1].

The synthesis of polymeric petroleum resins is performed by polymerization of unsaturated hydrocarbons (monomers) which are contained in the feedstock. The formation of polymers from monomers occurs due to multiple bonds or rings opening and due to combination of original monomer molecules into the polymer macromolecules. For the synthesis of the polymeric petroleum resins ionic (catalytic) or radical polymerization of monomers is used. From the choice of existing methods of radical polymerization thermal and initiated polymerization are most commonly used.

For the production of light polymeric petroleum resins fractions of liquid pyrolisis products, boiling up below 200 degrees Celsius are used, and for the production of dark polymeric petroleum resins higher boiling fractions or heavy pyrolysis resins are used. These fractions of liquid pyrolysis products are separted by distillation [2].

Polymeric petroleum resins are used in different branches of industry. The particular practical interest is given to the usage of polymeric petroleum resins in oreder to reduce the consumption of expensive and difficult-to-obtain products of natural origin, for example, vegetable oils (in paint materials), rosin (for papermaking), as well as wood-pyrogenic and indene-coumarone resins (in rubber mixes and for the manufacture of industrial rubber goods).

Paint and varnish industry consumes thousands of tons of edible vegetable oils, a large portion is used for production of dry oils and oil paints. Replacement of vegetable oils in paint and varnish materials for polymeric petroleum resins reduces the consumption of these valuable food products and makes it possible to use best farm lands for the production of other crops.

The intensive development of the petrochemical industry contributed to the emergence of a new group of synthetic binders for the production of paint materials, namely polymeric petroleum resins. The prospectivity of this group of synthetic binders is defined by cheap raw materials, the easiness in production, low investments and possibility of complex oil feedstock refining using non-waste technologies.

Pulp and paper industry is one of the major rosin consumers. In the process of paper manufacturing twenty-five per cent of all rosin produced in the world is used. Because of high development rate of such industries as pulp and paper, chemical, oil refining, petrochemical and others which are considered as major

consumers of naval stores, the demand for rosin is getting higher and higher and surpasses its production rate. All this leads to the necessity of invention of rosin substitutes in different branches of industry. Patent and technical documents, home and foreign technologies indicate that polymeric petroleum resins can help to reduce rosin consumption.

Prodction of tires and industrial rubber goods, meeting all modern demands, is impossible without effective ingredients in rubber mixes, plastifiers.. Polymer plastifiers or softeners - are substances that increase plasticity and elasticity of polymers during their processing and use. Coumarone-indene resins, which are so-called active softeners, contribute to even distribution of ingredients, in particular, they improve the dispersion in the mixture of fillers and that, in its turn, increases the elasticity of rubber mix and improves physicochemical properties of vulcanizers [3].

These softeners are also used in the process of rubber regeneration. Spent rubber and vulcanized rubber are usually subjected to regeneration in order to decrease production costs of manufactured goods and to use

In search of extra feedstock sources for the manufacture of resins-softeners, attention was paid to some wastes of coke-chemical technology, containing resin-like substances, similar in their composition and properties to indene-coumarone resins. Among these products residuals of raw benzene processing and polymers, obtained by regeneration of washing oil are of some practical interest. For the production of the styrene-indene resins residuals of hydrocarbon pyrolysis products distillation (heavy pyrolysis resins) are among the most successfully used [3].

Liquid products of pyrolysis, obtained as by-products during ethylene production are widely used as cheap feedstock for the manufacture of polymeric petroleum resins. Nowadays two factors determine the economics of ethylene production – feedstock cost and cost of obtained by-products. While feedstock cost is an external factor for ethylene production, cost of by-products is directly connected with the method of their processing – they can be sold like fuel or they can be further processed in order to separate some valuable components.

Phenolformaldehyde, rosin-maleic and alkyd resins were widely used as synthetic film-forming materials for the production of printing paints. Such expensive and deficit products as rosin, vegetable oils and alkylphenol were used as feedstock for their obtaining. Nowadays polymeric petroleum resins are finding increasing application for the production of print paints [4]ю

Both production of polymeric petroleum resins and their use in national economy is economically effective. In the first case economical effect is reached by afficient use of liquid by-products of pyrolysis and by gaining extra-profit from realization of polymeric petroleum resins. In the second case – by application of polymeric petroleum resins instead of such expensive products as vegetable oil, rosin, etc.

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MECHANISM AND KINETICS OF ENGINE OIL AGEING AND MODERN RECYCLING TECHNOLOGIES

ANTON FAKEYEU, SERAFIMA POKROVSKAYA
Polotsk State University, Belarus

At present, more and more attention is paid to waste-free use of all possible products. Re-use of waste oil will allow to make the most efficient use of oil resources, and to eliminate damage to the environment.

Introduction. Engine oils – are petroleum base lubricating oils and synthetic oils used in piston (carburetor and diesel), as well as in gas-turbine engines. Diesel engine oils applied to lubricating of autotractor, transport, stationary, diesel locomotive and ship engines are most widespread. Carburettor engine oils are used only in automobile engines. The oils intended for both types of engines, refer to universal. Special group of