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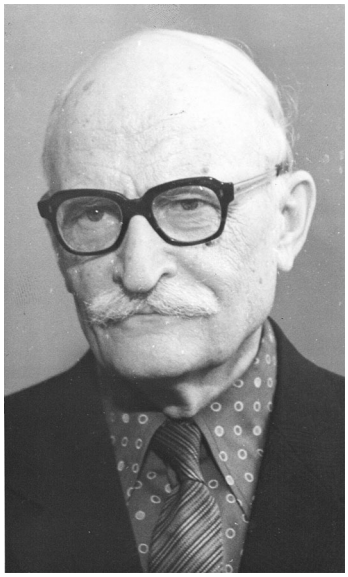
EDITOR'S PAGE

OIL SHALES – AN ALTERNATIVE SOURCE OF FUEL AND RAW MATERIALS



Representatives of republics of the former U.S.S.R. took part in a symposium on oil shale organized by Saratov State Technical University. The representatives informed the participants of their future developments in oil shale industry at increasing prices of crude oil and natural gas.

The main attention was paid on Russian oil shale resources, especially on development of deposits of Volga-Pechersk shale-bearing province extending from the Caspian Sea to the Komi Republic. In this great territory a number of prospective deposits for starting oil shale industry has been discovered.

Volga-basin oil shales differ in their high sulfur content which in some cases exceeds 6% on dry shale basis. Sulfur belongs mainly to shale organic matter. The mineral part is calcareous-clay marl.

Successful development of oil shale industry in the Estonian Republic, especially effective operation of the solid heat carrier units (the Galoter process), has been pointed out.

The prospects of starting oil shale industry in the Volga region and using high-sulfur shales as fuel and complex raw material were also discussed.

Continuous growth of world prices of natural gas and crude oil puts application of oil shales for power production high on the agenda. A report was presented on design of combined steam-gas power equipments with inside-cyclic gasification of fine-grained oil shale in pressurized steam-oxygen or steam-air stream with utilization of clean sulfur-free gas for gas turbines as part of combined steam-gas power plant.

In the nearest future those plants will be competitive with thermal power plants burning coal and natural gas.

Emission of sulfur dioxide into the air can be also limited by burning fine-grained oil shale in circulating fluidized-bed boilers. In fluidised-bed boilers sulfur dioxide reacts with calcium oxide forming at dissociation of

carbonates present in the mineral part and giving sulfates which in the ash residue represent no danger to the environment.

Ash residues of gasification or combustion of Volga-basin oil shales may be processed in production of various building materials.

Special attention was paid on the importance of Volga-basin shales as a valuable organic-mineral raw material for producing heterocyclic sulfur compounds like thiophene and its homologues. Experiments have shown the presence of thiophene homologues in the low-boiling fractions of retort oil. High-speed retorting of oil shale up to 800–850 °C has yielded gas naphtha rich in unsubstituted thiophene. High-temperature processing of pulverized oil shale from a Volga-basin deposit has yielded gas naphtha that contains more than 20% unsubstituted thiophene. Such a product is of a great value for organic synthesis.

Thiophene chemistry has been developing since the middle of the last century, as thiophene and its homologues are necessary to develop new routes in organic synthesis. Synthesis of medical and veterinary preparations and herbicides on the basis of thiophene homologues has been worked out and put into practice. Thiophene and its homologues are widely used in synthesis of special polymers, lubricating oils for cryogenic engineering and other products.

Utilization of Volga basin shales rich in sulfur in producing both power and chemicals may meet the needs for heterocyclic compounds not only in Russia but also in developed European countries.

Some other problems of oil shale utilization were discussed as well: application of natural oil shale as a component for production of some rubber ware and as additive to mineral fertilizers.

The progress in investigation and utilization of oil shales could have been much more considerable if the governments of new independent republics would have paid more attention on research institutions dealing with effective exploration of oil shales.

The participants of the symposium marked that the efforts of scientists of various states in the field of oil shale research must be combined to develop the world economy, as the effectiveness of oil shale utilization largely depends on the qualitative characteristics of individual oil shales.

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