RADIATION-CHEMICAL TRANSFORMATIONS OF OIL DEGRADATED ON WATER SURFACE AND IN THE SOIL

K.YAGUBOV, N.GULIYEVA, S.ALIYEVA, S.AHMEDBEYOVA*, R.SELIMBEYLI, I.MUSTAFAYEV
Institute of Radiation Problems, Azerbaijan National Academy of Sciences. 31-a H.Javid ave, AZ1143 Baku, Azerbaijan. imustafayev@mail.ru
*Institute of Petrochemical Processes named after Y.H.Mammadaliyev, Azerbaijan National Academy of Sciences.

The regularities of radiation-chemical transformation of the oil undergoing degradation on the surface of water and in soil are studied. The formation of gases - H2, CO, CH4, C2H4, C2H6 and changes of density, viscosity and molecular structure of oil depending on adsorbed dose of accelerated electrons are established. As a source of accelerated electrons the linear pulse electron accelerator ELU-6, with power of the beam up to 1 kW is used. Power of the electron beam has been determined by the combined method of Faraday cylinder -calorimeter. During the irradiation the initial reagent under the electron beam heated up to 60C, that measured on reaction vessel. Process was spent in the quasi-flowing laboratory installation, formed gases and liquid products have collected in the receiver for liquid and gasometer. The regularities of radiation-chemical transformation of crude oil from the oil-well are studied also in order to compare of the results .
The highest yields of gases are observed in the samples of oil taken from the oil-well. In content of gaseous products 95 % makes hydrogen. Radiation-chemical yields of gases H2, CO, CH4, C2H4, C2H6 are resulted on table

Table. Values of radiation-chemical yields of gases at the radiation-chemical transformations of *samples of oil,*

Samples of Balakhani oil	H_2	CO	CH_4	C_2H_4	C_2H_6	ΣC_3	ΣC_4	ΣC_5
From oil well	1,81	0,007	0,04	0,011	0,0046	0,002	0,0004	0,00003
From Water surface	0,36	0,022	0,015	0,004	0,003	0,002	0,0006	0,0003
From soil	0,55	0,032	0,053	0,0086	0,01	0,006	0,001	0,0002

It has been shown, that with increase of the absorbed dose up to 3000 kGy the density of the sample from the well grows from 881.1 up to 890.0 kg/m3, and viscosity grows from 39,580 till 59.77 mm2/s .

In the Infrared-spectrum of the irradiated samples significant changes in the field of 1380-1720 sm-1 corresponding to groups of CH2, CH3, C=C-aroma and C=O are observed.

In the framework of the radiolysis of complex mixtures of hydrocarbons , including of polycyclic aromatic systems the mechanism of influence of accelerated electrons on the oil fractions taken from the environment is discussed. Increasing of radiation stability of oil on the water surface and in the soil speaks its degradation under influence of physical, chemical and biological factors of the environment.

The prospects of application of accelerated electrons for clean up of environment from oil pollution are estimated.