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Non-ionic Surfactants Based on Polyoxyethylated Copolymers Used as Demulsifying Agents

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Non-ionic surfactants are used as efficient demulsifying agents for breaking emulsions, first of all, for destabilizing of crude oil emulsions. The quality of oil and oil products depends on the oil nature and other factors such as amount of water, salt and mechanical impurities. Oil emulsions forms as a result of mixing oil with ground water [1]. Demulsification (emulsion breaking) is necessary in many practical applications as the oil industry and waste water treatment in environmental technology. The emulsion stability results from the presence of interfacial barrier preventing coalescence of the dispersed water droplets. The most effective method to overcome the problem is to demulsify the crude oil by using demulsifiers [2]. Non-ionic surfactants based on copolymers showed high efficiency due to their surface activity at the oil – water interface and ability to displace natural stabilizers of oil [3]. This paper presents the effect of demulsifying compositions based on polyoxyethylated compounds for oil from Kazakhstan fields. The thermochemical dewatering was carried out at temperature from 40°C to 70°C. The water amount was identified by using Dean-Stark method. The sample of oil contents 22,3% of water. IR-spectrum data prove the amount of water in this oil. The micro-pictures obtained by optical microscopy show the size of water droplets in oil medium equal to 5-25 mkm. Demulsification of the crude oil is a primary processing of oil involving dewatering and desalting of oil. Demulsification is an important problem for Republic of Kazakhstan because our country is one of great oil producing one. West Kazakhstan oil (Zhana Uzen field and others) differs by high density and stability due to high molecular surface active components: high molecular paraffines, resins and asphaltenes. It was confirmed by gas chromatography data. The composition based on block copolymers of ethylenediamine showed dewatering degree equals to 1,32%. The most optimal ratio in compositions is 1:1. Demulsifiers are dissolved in kerosene and benzene. Maximum result was obtained with using the following composites: PE 6100: RPE (1:1) – W=51,95%, Basorol 150 R₁ : RPE6100 (1:1) – W=47,62%, where PE 6100 : RPE, Basorol – are block copolymers based on alcohols and diamines.

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[2] Ivanov I.B., Kralchevcky, P.A. Stability of Emulsion Under Equilibrium and Dynamic Conditions. *Coll. Surf. A. Physicochemical and Engineering Aspects*. **1996**, 128: 155-175.

[3] Omarova, K.I., Adilbekova, A.O., Kabdush A., Eshpanova, Zh., Behavior of polycomplexes of nonionic surfactants at the different interfaces and at the displacement of liquids from porous systems. *IV International Conference on colloid chemistry and physicochemistry mechanics*. Moscow, Russia, **2013**, pp 365-366.