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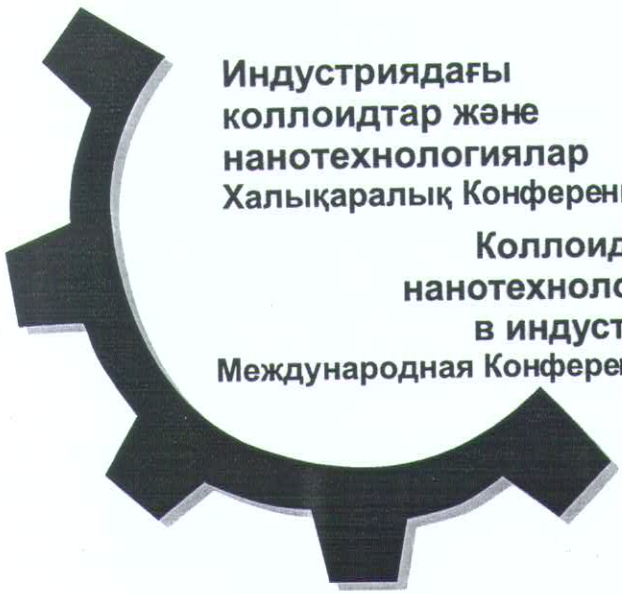
Excellence Polytech



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Abstracts

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THE MODIFICATION OF COAL SURFACE BY SURFACE-ACTIVE SUBSTANCES

M.Zh. Kerimkulova, K.B. Mussabekov, K.I. Omarova

Al-Farabi Kazakh National University

Adsorption of surface-active substances on a solid surface changes the surface nature - transition from not wettenef hydrophobic surface to hydrophilic surface up to full wetting waters (water solutions) on a solid surface is possible. In case of coal improvement of wettability of its surface by water allows to receive stabile water suspensions of coal.

Wetting action on a surface of coal particles by d sodium odecylsufphate and no ionic SAS – OP-10, has been studied. With growing of SAS concentration appreciable decrease in a corner of wetting (hydrophylizating coal surfaces) is observed. It is known, that if the surface of a solid body is hydrophobic (in particular for coal) SAS from water solutions of it is adsorbed both on a solid surface and on solution-air interface. On an interface surface of a molecule of SAS settle down according to a Rehbinder rule of equalising of polarity. Adsorption of SAS on coal proceeds as a result of hydrophobic interactions of a surface and not polar radicals of molecules of SAS with orientation of polar groups in a water phase. As a result the surface tension on the solid/liquid and a liquid/gas interface will decrease and according to the equation of junge the surface of solid body (coal) is wetting better.

Reduction of a surfeace tension on solid/liquid interface promotes increasing of aggregate (thermodynamic) stability of dispersions of coal as in conformity a thermodynamic parity for high-disperces systems decrease σ leads to reduction of free energy of system and, consequently, to increasing of thermodynamic stability of disperse systems.

Typically not polar adsorbent - coal - is heteropolar as at interaction with oxygen of air or water forms oxides of various type more often. Therefore at wetting by pure water the wetting corner can be less 90°.

The quantitative characteristic of wetting ability of a liquid is the size of work of adhesion (more precisely a parity of work of adhesion and когезии). On the basis of data on surfece tension, wetting corner values of works of adhesion (W_a), kogesion (W_a) and wetting (W_w) have been calculated. Isotherms of a surface tension of the investigated SAS have the classical form, characteristic for all effective surface-active substances.

For both SAS the insignificant increase in W_w with growing of solution concentration according to fall of a surface tension and wetting corners is observed. From equation Djupre the wetting condition is expressed by next parity: Wa> 0.5Wk. Comparison of sizes of adhesion and cochesion works shows, that the condition of wetting of a surface of coal is carried out by solutions of the investigated SAS at all concentration and considerably increases with increasing of solution concentrations.

Thus use of investigated SAS makes active process of coal daspergating, improves wettability of coal particles and, accordingly, raises stability of coal suspensions.