

Қазақстан Республикасы
Білім және ғылым министрлігі
Қ.И. Сәтбаев атындағы Қазақ ұлттық
техникалық университеті
Excellence Polytech Халықаралық
жоғарғы оқу орнынан кейінгі білім беру
институты



Министерство образования и науки
Республики Казахстан
Казакский национальный технический
университет имени К.И. Сатпаева
Международный институт
послевузовского образования
Excellence Polytech



Abstracts

Colloids and Nanotechnologies in Industry 2010 International Conference



Almaty 2010



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WATER COAL FUEL - FUTURE FUEL

K.B. Mussabekov¹, M. ZH. Kerimkulova¹, N.E. Bekturganova²

¹ *Al-Farabi Kazakh National University*

² *Kazakh national technical university named by K.I. Satpaev*

The electric power developed by burning of coal on thermal power plant (TPP) not so cheap, as it includes, except reception of steam of the electrogenerator, necessary for rotation also the whole bouquet of auxiliary and additional knots: unloading, storage, preparation and coal giving on burning; a railway economy, paths fuel conveying system with knots sprinkle, crushers, bunkers, mills and dust-systems. Coal is scattered, ignites spontaneously, пылит, and the dust blows up. Therefore there are systems пылеподавления, аспирации, hydrowashout with treatment facilities. All these additional knots increase volumes and cost of building TPP, complicate work of the operational personnel, not providing an absolute guarantee of safety and normal sanitary-and-hygienic working conditions. The new technologies, allowing to use advantage of coal are necessary, but to reduce to a minimum of complexity of its application. Transition from direct burning of coal in various top internal devices on preparation from coals of various qualities, including from a waste углеобогащения, water coal fuel (WCF) can become essentially important decision for coal power. Basis WCF is water coal suspension (WCS).

The idea of water coal fuel far is not new. From the beginning of 70th years of the last century in a number of the countries, including in the USA, Canada, Italy and China, works on research and creation of trial, demonstration and commercial installations on manufacture and use BYT are conducted.

The technology of preparation of water coal fuel consists of a two-level wet grinding of coal in spherical mills, mix of plastificating and stabilising chemical additives, giving of the received product on storage and the subsequent burning in chamber fire chambers of coppers.

Such technology has been realised in 80th years of the last century as a part of a trial complex «Belovo-Novosibirsk thermal power station-5».

The new technology of preparation WCF is based on cavitation to processing of dispersu coal, in which result WCS gets the big stability (till 3th years) and plasticity without additives even at high (70 %) the maintenance of a firm phase; completely dried up fuel passes at water addition in a condition of steady suspension without mechanical prompting; the stood fuel after defrosting restores the initial properties.

Thus the majority of the developed countries of the world successfully are engaged in working out WCF on the basis of WCS.

Obviously, to Kazakhstan having rich stocks of coal, including brown coal and aspiring to enter number 50 of the developed countries of the world, it is necessary actively will join in working out, on the basis of own coal, BYC.

In this connection on chair the catalisy, colloid chemistry and oilchemistry of al-Farabi Kazakh national university within last 5 years researches on working out WCS, on the basis of brown coals of the Shubarkulsky deposit are conducted.

The optimum mode of dispergation coal on a spherical mill till the micron sizes in the presence of SAS (NaDDS, OP-10) and water-soluble polymers (NaCMC, PEI) is developed. The degree control of dispergating carried out on size of a specific surface, disperses samples. It is shown that for maximum dispergation it is sufficient 20 minutes.

With growth of concentration BYC its stability and viscosity (η) grow. For decrease η softener C-3 which at optimum concentration (0,2 %) essentially reduces viscosity BYC is used.

Influence of adsorption WSP and SAS on electrochemical properties of particles of coal is shown.