**Current state of production and use of sulfur in Russia**

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**Keywords:** Sulfur, production, surplus, consumption, the market, trade forms.

**Abstract.** The structure of manufacture of element sulfur has essentially changed in the end of the XX-th century in favour of regeneration from the hydrocarbon feedstock containing compounds of sulfur (mercaptans, hydrogen sulfide). Russia, along with the USA and Canada is the largest manufacturer of element sulfur. In 2012 manufacture of element sulfur in Russia was 6,5 million tons. The volume of consumption of sulfur in Russia in 2012 was 2,7 million tons. The basic direction of realisation of the Russian sulfur is export.In the present article the current state of manufacture and sulfur consumption in Russia is considered. Dynamics and structure of world production of sulfur is presented. The structure of manufacture of sulfur on the basis of sources of reception and trade forms of Russia is considereel. Dynamics and structure of consumption of sulfur in Russia and directions of realisation of the Russian sulfur are considered. Some prospects of development of branch are allocated.

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**About the mechanism of coal ash decompounding by alkaline solutions**

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**Keywords:** coal ash, solvability, solution of NaOH, alum earth concentrate, belit slime.

**Abstract.** To receive the alumine concentrate from coal- fired power stations ashes, which is available for aluminium hydroxide production, its solubility in sodium hydroxide solution (5 – 40% Na2O) was studied. As a result of ash dilution, which was containing 25 – 28% Al2O3, 55 – 60% SiO2, < 0, 5% Na2O, up to 60% SiO2 was recovered into alcalic solution. 98% Al2O3 stays behind in solventless breakdown product. A part of Na2O (10 – 12%) passed into the composition of insoluble rest. A new phase of the insoluble rest, hydrosodalite, was determined. As aresult a alumina concentrate, containing 35 – 36% SiO2, 35 – 39% Al2O3 and 7 – 8% Al2O3, was obtained. It is a feed material for production of aluminium hydroxide and belt slime with 25 – 32% SiO2 and 45 – 38% CaO content (molecular ratio CaO:SiO2 = 1,90 – 2,02). Belit slime is suitable as afeed material for cement production.

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**Denitration of spent sulphuric acid methanol**

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**Keywords:** spent sulphuric acid, Gibbs energy, denitration, methanol, material balance.

**Abstract.** Thermodynamic calculations of the interaction between oxides of nitrogen (III) and nitric acid with methanol with the restoration of the nitrogen compounds to nitrogen oxides (II) and (I) and elemental nitrogen, and carbon compound in methanol to carbon oxide (II) and (IV) were wade. The Gibbs energy of formation of these oxides and elemental nitrogen is negative and sufficiently large in absolute value. To validate the results of thermodynamic calculation study for the denitration of sulfuric acid, 1,18 % HNO3, methanol and determined the composition of the gas phase in the denitration process. The reliability of the obtained data analysis also confirmed by the calculation of material balances for nitrogen. The content of nitric oxide (II) was about 60 %, and the total content of N2 and CO2 of the order of 40 %. This nitrous gas after appropriate training should be directed to the absorption zone. Given interpolation equation to calculate the composition of the gas phase.

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**Influence of Impurities in Raw Material on the Activity of Chromia-Alumina Catalyst in the Process of Isobutane Dehydrogenation**

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**Key words**: microspherical chromia-alumina catalyst, dehydrogenation, isobutane, isobutylene, coking behavior, catalyst deactivation, activity recovery.

**Abstract.** The in flueuce of impurities in industrial isobutene fraction on microspheric Al-Cr catalyst activity in the process of dehydrogenation of isobutene into isobutylene was studied. Whereby, the catalyst deactivation was investigated under conditions of increased content of unsaturated, oxygen- and sulfur-containing compounds and moisture in еру raw materials. Such approach allowed to establish threshold concentrations of analyzed impurities: for unsaturated hydrocarbons on the level of 1 % wt., for oxygen- and sulfur-containing compounds – 0,5 % wt. and 0,03 % wt. respectively; for moisture – 0,5-1,0 mg/L. It is shown that the efficient performance of Al-Cr catalyst in industrial conditions requires hard limitations on impurities content in raw material. The obtained results can be used in practicing the operation activity of commercial units of isobutene dehydrogenation into isobutylene.

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**A study of catalytic activity and stability of sulfated oxide of transition metals in vapor-phase dehydration of glycerol to acrolein**

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**Keywords**: glycerol, dehydration, acrolein, catalyst, conversion, selectivity

**Abstract.** A stability and activity of sulfated metal oxide catalysts in vapor-phase dehydration of glycerol to acrolein were studied. The influence of acid properties of used catalytic systems on their deactivation and selectivity towards acrolein in the course of dehydration of glycerol was were stablished. It was shown that the high acidity of these catalysts leads to their rapid deactivation due to the formation of coke deposition on its surface. It was shown that increase in concentration of acid sites leads to increase in catalyst deactivation. Among the examined samples SO42-/Al2О3-Fe2O3 catalyst had higher stability in the vapor-phase dehydration of glycerol to acrolein. If this catalyst was used deactivation was equal to 2.4 %, and the main reaction product was the allyl alcohol.

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**The necessity of using boron in the elastomeric compositions**

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**Keywords:** molecular complex, boron, an antioxidant, the elastomeric composition.

**Аbstract:** The positive role of boron is in the influence of the weakening of the ozone exposure and maintaining the adhesive properties of rubber-compositions. The effect is manifested in a relatively small boron content in the elastomeric composition.There are two basic ways to introduce boron into the elastomeric composition. First - boron complex enters a boron polyoxides, second - a clathrate complex. When using any of these methods, the content of elemental boron in rubber mixtures should not exceed 0.04 parts by weight to 100, 00 parts by weight of rubber. In the case where the content of boron in the elastomer exceeds the optimum, changes in the spatial structure of the vulcanization are significant.

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**The induction period of oxidation of ethylbenzene as a stage of formation of the active form of the catalyst**

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**Abstract**. In this work, the basic factors affecting the accumulation of trivalent cobalt in the oxidation reaction of ethyl benzene model were presented. It is known that, the exhaustion of hydrocarbon in the liquid phase oxidation reaction begins after the transition of catalyst from divalent to trivalent form. The stage of accumulation of active form of the catalyst is considered to be the induction period of the process, which can range from few minutes to hours for various hydrocarbons and catalysts. The Study of oxidation of cobalt (II) ion was carried out by varying the initial concentrations of cobalt (II) stearate, the oxygen contents in the oxidant gas in the presence and absence of additives of intermediate products of hydrocarbon oxidation.

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