According to our research, the optimum sizes of active parts of the catalyst are in the range 45-55 nm. The specific surface of the catalyst found from the full isotherms of low-temperature adsorption of nitrogen by BET method makes 12.55 m^2/g. The integral volume of pores is 0.57 ml/g. Fig.-2 shows SEM images of isolated aluminosilicate microspheres extracted from fly ash of Almaty TPP-2, working on the Ekibastuz coal.

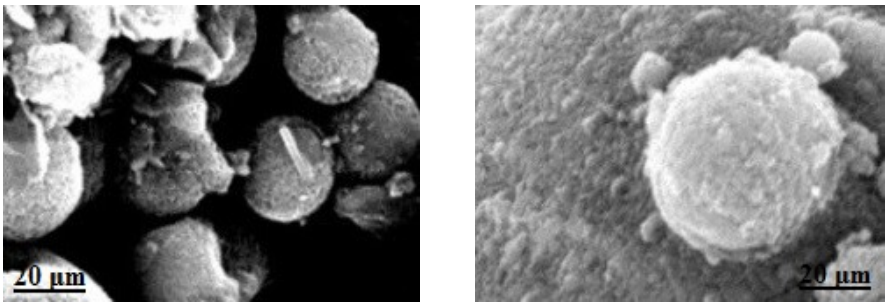

Fig.-2: SEM Images of Aluminosilicate Microspheres extracted from Fly Ash of TPP-2 (Almaty), working on the Ekibastuz Coal

The typical chemical composition of isolated aluminosilicate microspheres is represented by different oxides: oxides of aluminum, silicon, iron, calcium, strontium, zirconium and titanium (wt. %): Al_2O_3 (26.3); SiO_2 (59.05); CaO (1.88); TiO_2 (1.16); Fe_2O_3 (5.45); Na_2O (1.82); S (1.1); P (0.51); SrO (0.043); ZrO (0.051). Thus, the composition of cenospheres is very valuable, which makes it possible to obtain catalysts or sorbents that are multifunctional and resistant to poisoning.
According to X-ray diffraction analysis, the Taizhuzgen zeolite contains the following components (concentration, % intensity): Fe (49.939/739.15); Ca (1.715/9.16); Sr (0.270/1.98); Mn (0.129/1.81); Al (21.955/0.31); Si (23.114/0.98); Ti (1.903/20.87) and K (0.976/1.96).

Purification of Gas Emissions from Sulphur Dioxide

The results of testing a modified catalyst based on fly ash on a flow-through vortex installation of the "Emulsifier" type, with a capacity of 2 m^3 / h, are presented in Table-1. Tests have shown that the sulfur dioxide removal rate was 86-95%.

Table-1: Catalytic Purification of Gases from SO_2. The Ratio of the Aqueous Solution to the Catalyst is -1:1.

Solution Composition, mol / L		SO_2 Content in the Gas Mixture, mg / m^3	
$FeCl_3$	Fulvic Acid	Before Cleaning	After Cleaning
$0.5\cdot10^{-3}$	$2.3\cdot10^{-3}$	1,511	200
$1.0\cdot10^{-3}$	$2.3\cdot10^{-3}$	104	150
$2.0\cdot10^{-3}$	$2.3\cdot10^{-3}$	1,511	120
$1\cdot10^{-3}$	$1.15\cdot10^{-3}$	1,511	205
$1\cdot10^{-3}$	$4.6\cdot10^{-3}$	1,511	170
$1\cdot10^{-3}$	$9.2\cdot10^{-3}$	1,511	130
$1\cdot10^{-3}$	$2.3\cdot10^{-3}$	1,511	180
$1\cdot10^{-3}$	$2.3\cdot10^{-3}$	1,511	120
$1\cdot10^{-3}$	$2.3\cdot10^{-3}$	1,511	90

The effect of the partial pressure of sulfur dioxide on the oxidation of sulfur dioxide with oxygen in an aqueous solution in the range of P_{SO2} from 420 mg / m^3 to 1,511 mg / m^3 in a gas mixture SO_2 - ArO_2 was studied at P_{O2}= 21 vol. %. The test results are summarized in Table-2.
In the studied interval of P_{SO2}, the degree of conversion at the maximum load of the pilot plant was from 60 to 86%, increasing with an increase in the partial pressure of sulfur dioxide in the gas mixture. After the absorption of 4.7 m^3 of gaseous sulfur dioxide (the concentration of SO_2 in the aqueous solution is 0.4 mol / L), the aqueous solution was separated from the catalyst and analyzed. Analysis showed the