RESOURCE-SAVING TECHNOLOGY FOR PROCESSING BY-PRODUCTS OF THE WET PHOSPHORIC ACID PROCESS – PHOSPHOGYPSYM AND FLUOSILICIC ACID TO PRODUCE AMMONIUM SULFATE

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Key Words: fluosilicic acid; phosphogypsum; ammonium sulfate

At present time, many producers of phosphate fertilizers faced with the challenge of processing and recycling of fluosilicic acid solutions (FSA), obtained in the process of absorption fluorine-containing gases. It is a pollutant with a primary concern and cannot be landfilled without treatment. Existing best available techniques for processing FSA involves production of silicofluoride and fluoride salts which market is very limited. As a result, the acid neutralized with lime. This method of treatment ultimately increases the amount of solid waste sent for storage. A better environmental alternative of this method is the use of technological solutions, which can allow processing FSA with production of substances demanded by the chemical industry. NIUIF has developed a technique (Pat. RU 2462419) of co-processing by-products phosphogypsum and FSA with production of ammonium sulfate without intermediate separation of silica according to the process block diagram shown in Figure 1.

This process based on neutralization of the FSA by a phosphogypsum. Gypsum, the main component of phosphogypsum, used for precipitation of F in form of calcium fluoride. After neutralization and precipitation, the suspension separated into solution of ammonium sulfate and mixture of calcium fluoride, gypsum and silica usable in the cement industry. Water solution of ammonium sulfate with low content of F and silica can be used for production of NS, NP, NPS and NPK-fertilizers.