CLEANING SYSTEM FOR CORROSIVE GASES AND HYDROGEN

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Results are obtained for studying removal of hydrogen from gas mixtures, shipment through a pipeline, and also removal of oxidizing gases (oxygen and chlorine) using a fuel element. A unit is created in order to carry out experiments based on a fuel cell.

Results have been obtained for research work performed at TATA center laboratories for removal of hydrogen from gas mixtures, transported through pipelines, and also for removal of oxidizing gases from mixtures. The idea of the experiments was to use a fuel element for both removal of hydrogen and for removal of excess oxidizing gases such as oxygen or even chlorine (Fig. 1).

Within a large-scale project, when it is necessary to utilize up to 10% hydrogen, the fuel element may provide electrical energy for production needs, for example, for accomplishing thermoelectric liquefaction of chlorine in a gas stream.

A unit was created (Fig. 2) for performing experiments based on a research fuel cell. The amount of catalyst (Pd) on a membrane of the Nafion type was optimized for this task, and a test fuel assembly was made. The experiments were carried out in an extraction cabinet Mistral-001 of TATA construction.

The results of experiments confirmed the possibility of removing hydrogen and oxidizing gases from mixtures, and also the possibility of generating electrical energy for subsidiary production needs.

Fig. 1. Pipeline with fuel element.

Fig. 2. Unit for studying removal of hydrogen and oxidizing gases from mixtures.

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