

Process and device for the separation of foreign gases from a reducing useful gas by steam-driven pressure swing adsorption

Abstract

The invention relates to a process for purifying synthesis gas by means of a pressure swing adsorption unit which is desorbed by a vacuum produced by a so-called ejector, which is driven by steam generated by a heat exchanger which uses the heat in the flue gas duct or in the useful-gas duct for the generation of steam, the pressure swing adsorption unit being operated advantageously in cyclic turns of adsorption under excess pressure, depressurization desorption and vacuum desorption and the gas desorbed by the ejector being cooled in a cooler so that the contained steam can be condensed and discharged or is advantageously returned to the feed gas for the synthesis gas production and the foreign gas desorbed by the pressure swing adsorption unit, which contains at least partly not yet consumed fuel gas, is recycled to the fuel gas. In an advantageous embodiment, the vacuum from the ejector is stored in an intermediate tank and applied to the pressure swing adsorption unit according to the vacuum desorption cycle. The invention also relates to a device for running this process.

(Drawing to be published with the abstract: FIG.1)