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Integration challenges of an Air Separation Unit with a thermal power plant

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Development of oxy-combustion technology requires relatively low purity oxygen (90 - 95% O₂) in quantities exceeding the present oxygen production by orders of magnitude. Oxygen of the required purity level can be produced in cryogenic or sorption plants. Both technologies can be coupled with thermal power plants electrically or thermally. The exemplary coupling methods include use of cogeneration heat for sorbent bed regeneration or lignite drying with heat recovered from the air compressors. It is also possible to combine the PSA method with a swing of temperature by using waste heat from combined heat-power generation (cogeneration) processes, leading to pressure temperature swing adsorption (PTSA). The paper shows a thermodynamic and economy analysis of different couplings of ASU with thermal power plant. A concept of energy storage in liquid gases in order to smooth the oxygen production independently of the power plant load is discussed.

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