

METHOD AND APPARATUS FOR PURIFYING AMMONIA

ABSTRACT

Ammonia is purified by a membrane unit to concentrate ammonia and/or ammonia and moisture. Moisture is removed in a temperature-swing adsorption unit. The resultant product of such purification is then partially condensed to remove light components of other impurities and then partially vaporized to produce a pressurized ammonia product lean in heavy components. If the feed stream is processed through the membrane unit first, the permeate stream will be lean in such impurities as carbon dioxide, nitrogen and methane. Moisture and any carbon dioxide not removed in the membrane unit is then removed by the adsorption unit. The resultant stream produced by action of the membrane and adsorption units is then partially condensed to produce a liquid lean in light impurities. Such liquid is then partially vaporized within a product pressure vessel to produce ammonia vapor lean in heavy impurities and at a required operational pressure.

Fig. 1