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Installation and Operation of High Purity CO Gas Recovery Plant

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Synopsis :
Mizushima Works installed a high purity CO gas recovery plant COPISA (CO pressure induced selective adsorption) and began its CO supply to a neighbouring chemical factory in July 1985. COPISA separates a high purity CO gas from the BOF gas by the PSA process. From the BOF gas, which consists mainly of CO, CO2 and N2, CO2 is adsorbed in the 1st stage adsorption, and CO is selectively adsorbed in 2nd stage adsorption. By this process, more than 98% high purity CO is recovered. Capacity of this plant is 410 Nm3/h, and product CO is used as raw material for synthetic chemistry and also as the bubbling gas in the steelmaking process.

The body can be viewed from the next page.

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recent years, in the sale of gases to the makers of industrial gases such as liquefied oxygen, nitrogen and argon gases, and in the manufacture and supply of city gas to city gas makers, the Mizushima Works has even reached

The high purity CO gas which is used in this reaction is under particularly severe restrictions on H_2O (dew point) and O_2 (because of generation of H_2O by reaction with H_2), because the catalysts HF and BF_3 are decom-

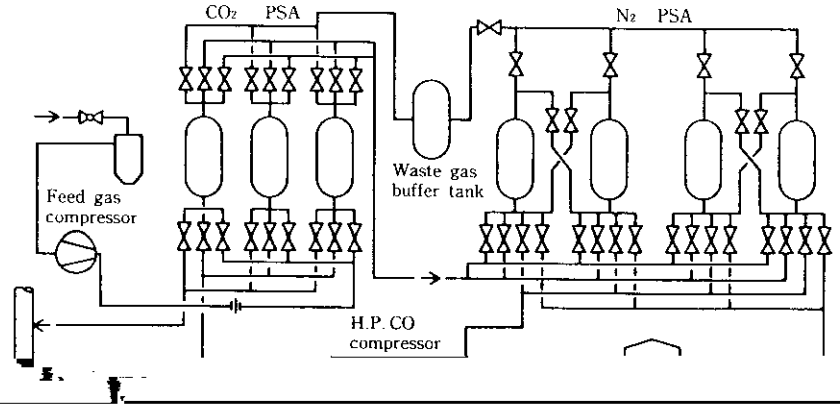
gas makers. Cooperation among industries in the com-

met:

whereas in the COPISA process, electric power is the principal cost item, although it is predicted to be reduced to about 50% of the total on a variable cost basis. Therefore, after taking into consideration the effective utiliza-

for the BOF gas is about 0.5 to 1.5 kg/cm^2·g, a BOF gas compressor of the reciprocating type, a Roots blower, or screw type device can be used.

4.2 CO_2 Separation Process


CO_2 PSA
N_2 PSA
Feed gas compressor
Waste gas buffer tank
H.P. CO compressor

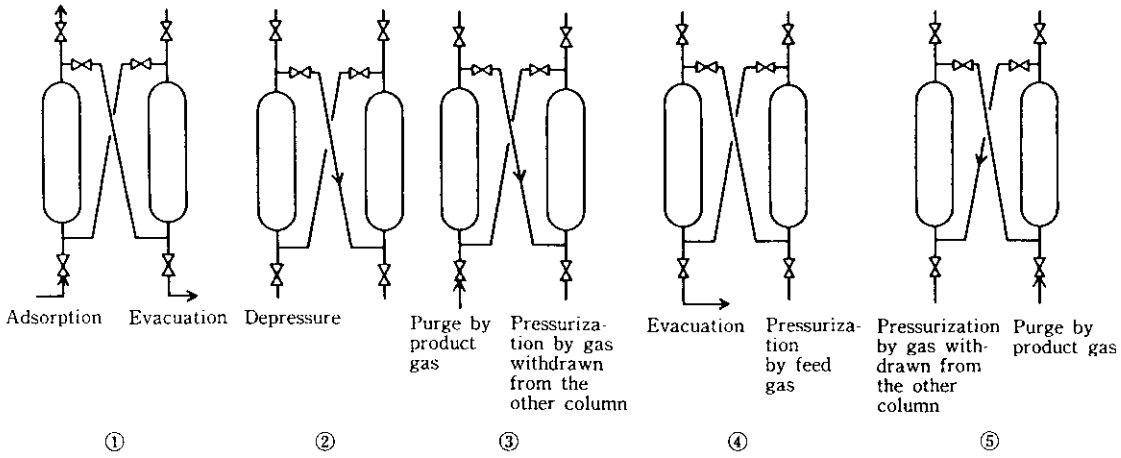


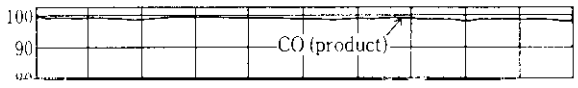
Fig. 6 Operation of de-N_2 PSA

(1) Adsorption (**Fig. 6** ①)
The gas from the de-CO_2-PSA is passed through the

→ product CO compressor (low pressure) → product gas buffer tank

from the 98% purity CO

from the N_2 separation process, to produce the CO



waste gas from the present plant has a calorific value of about 1 700 kcal/Nm^3, and is recovered into the BOF