ABSTRACT OF THE DISCLOSURE

TITLE OF THE INVENTION:

MULTIPLE COLUMN NITROGEN GENERATORS WITH OXYGEN COPRODUCTION

The present invention is an improvement to a nitrogen generator enabling the process to efficiently coproduce oxygen with low recovery, typically less than 70% and preferably less than 55%, in addition to the primary product, nitrogen. In the nitrogen generator process, air is distilled in a distillation column system having a higher pressure column and a lower pressure column. The feed air is compressed, treated to remove water and carbon dioxide, cooled to near its dew point and fed to the higher pressure column of the distillation column system. The nitrogen product is produced by removing an overhead vapor stream from at least one of the columns of the distillation column system. At least one oxygen-enriched stream is removed from the lower pressure column. The improvement is characterized in that: (a) the oxygen-enriched stream is removed from the lower pressure column at a location that is at or below the feed to the lower pressure column; (b) feeding the removed oxygen-enriched stream to a supplemental distillation column for separation into an oxygen bottoms and a waste overhead; (c) providing boilup to the supplemental distillation column and (d) removing an oxygen stream (vapor or liquid) from the bottom of the supplemental distillation column as an oxygen product.

(Figure 1)