

NITROUS OXIDE PURIFICATION SYSTEM AND PROCESS

Abstract

Provided are a system and method for nitrous oxide purification, wherein the nitrous oxide product for use in semiconductor manufacturing. The system and process involve a first sub-system having a purification tank for holding a liquefied nitrous oxide, therein; a vaporizer in communication with the purification tank to receive, vaporize and convey a nitrous oxide vapor back to the purification tank; a distillation column disposed on a distal end of the purification tank to receive a nitrous oxide vapor; a condenser disposed on the distillation column, wherein light impurities are removed and wherein a nitrous oxide devoid of light impurities is conveyed and converted into vapor in said vaporizer. A second sub-system having a first dry bed vessel is disposed downstream of the vaporizer to receive the vapor and reacting the acid gas therein; a second dry bed vessel downstream of the said first dry bed vessel for removing water and ammonia in the vapor. A third sub-system having a product tank wherein the purified nitrous oxide vapor is recondensed; a transferring manifold including a liquid pump, liquid filter and a bypass for distributing the purified nitrous oxide to holding vessels.

sole figure