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Regulating of Gas impurity in Helium Refrigeration System at a Reactor CNS

Helium is widely used at reactor cold neutron source cryogenic system(CNS). It is well known that gas purity control is very important in an expansion-turbine-based helium refrigerator.High levels impurities such as nitrogen,hydrogen or organics can cause to process faults.What's more,high hydrogen concentration will trigger the reactor.It's owing to the hydrogen concentration monitoring in CNS is used to estimate the hydrogen leakage inside moderator chamber.Usually,the hydrogen and organics comes from compressor oil degradation and oxidation.These unexpectable gas always be detected by gas chromatography during one thousand operating hours after change new compressor oil.The impurities mostly are condensed in adsorber inside Cold-box. Nevertheless,they are overload for available liquid nitrogen adsorber. Methods are found to remove the hydrogen and other compounds in helium completely.Systems operating safety are ensued.In this paper,we will share the valid experience in the cryogenic system.

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