

The experiments of a two-stage pulse tube cryocooler with pressed Er-plated screen as regenerator material

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Regenerator is an important part in regenerative cryocoolers, which is the main part to provide cooling power through the heat exchange of the helium and the matrix inside that. When the temperature is below 20 K, the specific heat capacity of the helium increases and exceeds that of the stainless steel, which limits the process of heat transfer in the regenerator and limit the increase of the cooling power of cryocoolers at 20 K. In order to increase the cooling power of the two-stage thermal-coupled pulse tube cryocooler working in the 20K temperature zone, the regenerative material was optimized in this paper. Stainless-steel screen, Er-plated stainless-steel screen and pressed Er-plated stainless-steel screen were used as the regenerative material. The porous parameters and the experimental results of these kinds of materials were compared.

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