Operational Principle of MicroJet Cryo Trap (MJT-1030E)

US Patent : US 6,190,613 B1

Analysis of dilute components in gases or volatile components desorbing from heated sample in a wide band range requires trapping of these components at the head of column by cooling, followed by rapid thermal desorption. We have developed MicroJet Cryo Trap (MJT-1030E) which consists of a mechanism to liquify N_2 gas and micro jet tube for cooling and thermal desorption at the head of column.[1)]

The flow scheme of MJT-1030E is shown in Fig. 1 and the operation of micro jet tube in cooling and thermal desorption modes is shown in Fig. 2. N_2 gas from N_2 cylinder is liquified through thermal exchange coil immersed in liquid N_2 and is fed to micro jet tube located in the GC oven via N_2 transfer tube. Inside the micro jet tube are a temperature sensor and column holder (metal tube), and the separation column runs through the column holder and is secured. Liquid N_2 jet is blown against the column in the column holder, and the portion of the column is cooled down to -180° C or below. Liquid N_2 goes out from the both ends of the micro jet tube and is rapidly evaporated, preventing moisture to get into the micro jet tube to become frozen. Once the liquid N_2 micro jet is turned off, heated air in the GC oven will rapidly heat the cooled portion of the column at 800° C/min, causing the trapped components to be thermally desorbed.

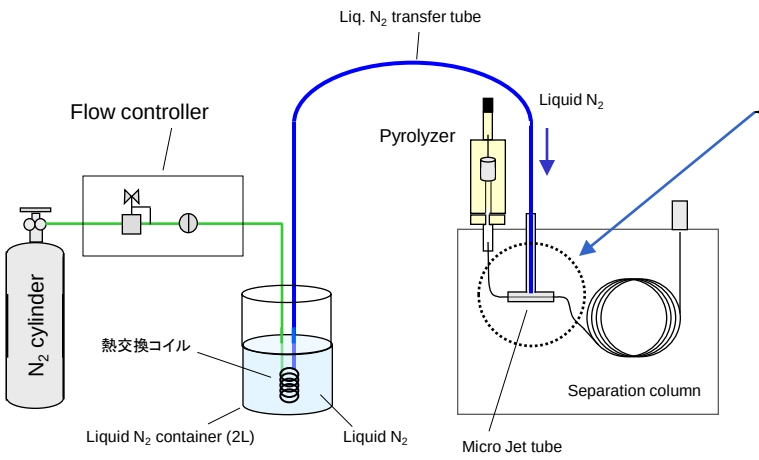

Fig. 1 Flow Scheme of MJT-1030E

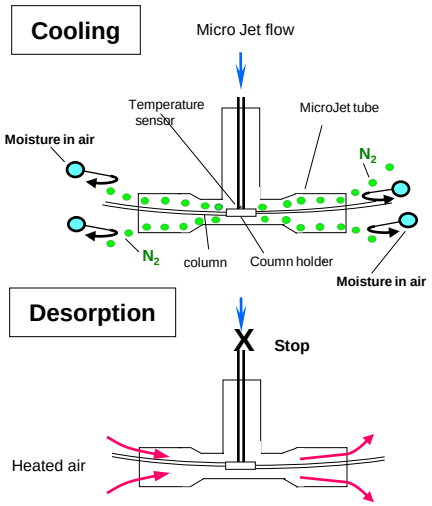

Fig. 2 How MicroJet Cryo Trap Works in Cooling and Desorption modes

1) Hosaka, et al., 3rd Polymer Analysis Symposium, I-6, p15-16 (1998)

Keyword : MicroJet Cryo Trap, Operational Principle

Applications : General Polymer Analysis

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