Combined Applications of Supercritical CO_2 Extraction and Molecular Distillation

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Molecular distillation, also called short-path distillation, was applied to liquid-liquid separation from the extracts of supercritical CO_2 / subcritical solvent. Molecular distillation has the characteristics of high-level vacuum (1-10 Pa), low distillation temperature (far below than the boiling point), short heating time (5-20s), and continuous feeding. The moisture, residual solvents, and impurities can be separated by different temperatures, which do not merely depend on the solubility in CO_2 in the separating vessel. Figure 1 shows the flow chart of supercritical CO_2 extraction and molecular distillation combined process.

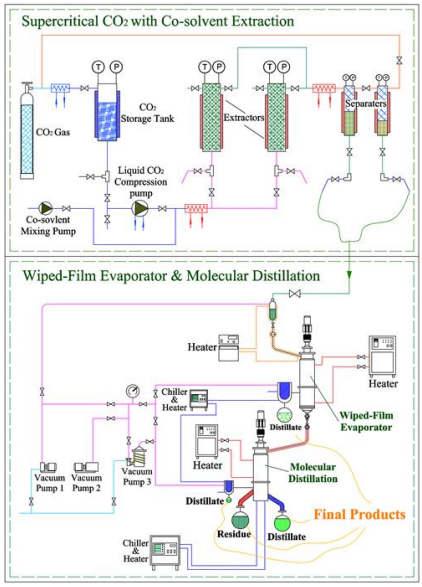

Fig.1 Flow Chart of Combined Process of Supercritical CO_2 Extraction and Molecular Distillation

Fig.2 Agarwood Oil Extraction and Separation Combined Process

Fig.3 Tobacco Oil Producing Process

1 Agarwood Oil Application

Supercritical CO_2 extracts of agarwood contain moisture, resinous materials. Through molecular distillation, moisture, transparent essential oil, partially volatile oil, and waxy substances can be separated, as shown in Figure 2.

Also, water-soluble extracts, essential oil, agarwood paste, and wood chip after separation were utlilized to produce facial mask, perfume, handmade soap, body lotion, air cleaner, incense, etc.

2 Tobacco Application

After supercritical CO_2 extraction of tobacco leaf waste, the flavor components are separated by molecular distillation and finally added to the cigarette, which can control the quality of the cigarette and reduce the tar and nicotine content, as shown in Figure 3.