

Polymer Prepper, A Simple Polymer Pulverizing Tool for Py-GC

Part 2: Comparison with Other Pretreatment Methods

In pyrolysis gas chromatography, the size and shape of sample have been known to significantly affect the reproducibility of pyrograms. The particle shapes and reproducibility of polystyrene pyrograms are compared using powder made by Polymer Prepper¹⁾ and that made by conventional freeze pulverization.²⁾ Fig. 1 shows SEM images of particle shapes of powders prepared by Polymer Prepper and freeze pulverization. It was found that Polymer Prepper gave particle size of 100~300 μm , significantly improved uniformity compared with conventional method. In Table 1, the reproducibilities of pyrograms of polystyrene are compared. Peak areas of styrene monomer and trimer observed in the pyrograms of polystyrene were examined. The results showed that polystyrene thin film prepared by stripping of solvent gave the best result, followed by fine powder made by Polymer Prepper, and then by freeze pulverization. Particles made by a cutter ended up with poor results. These results show that the reproducibility with Polymer Prepper is comparable to that with freeze pulverization, and that it is a low cost, quick and simple method for pretreatment.

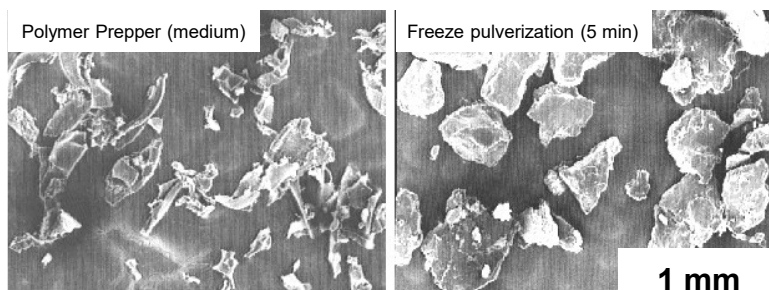


Fig. 1 Particle Shapes of Polystyrene Powdered by Polymer Prepper and Freeze Pulverization

Table 1 Sample Forms and Reproducibility of Pyrograms (polystyrene)

Pyrolysis temp: 550 °C
Sample size: ca. 0.5 mg

Sample form	Thin film	Fine powder		Small particles (cutting method)	
		Polymer Prepper (medium)	Freeze pulverization	4 pieces (0.4 mm square)	1 piece (1 mm square)
R.S.D.(%) of SSS/S	1.07	1.97	2.11	3.64	8.90

SSS: Styrene trimer

S: Styrene monomer

1) Polymer Prepper has been discontinued and is no longer available.

2) Watanabe, et al., 4th Polymer Analysis Symposium, IV-13, p118-119 (1999)

Keywords : Polystyrene, Freeze Pulverization, Pretreatment

Products used : Polymer prepper

Applications : General Polymer Analysis

Related technical notes :

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