

Discussion

On the capabilities of the rotating heater as a modulator for GCxGC—a reply

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In a recently submitted paper, Gaines and Frysinger [1] comment on a discussion of the merits and demerits of the first commercially available heater modulator, the Sweeper. In the paper they primarily refer to [2] and also in other recent literature [3–6], it is said that the application range of the Sweeper is more limited than that of cryogenic modulators. Gaines and Frysinger disagree and request that in all future discussions of rotating modulator performance, facts about the application range as they see them, are incorporated.

For a number of years, the Sweeper [7] has been the sole modulator that was commercially available. However, since some two to three years it is no longer produced and/or marketed. The manufacturer himself has given it as his opinion that cryogenic modulation is superior to heated modulation in terms of capabilities [8]. Even so, and while there are only a very limited number of users of the Sweeper left, it is of interest, for the sake of a precise historiography, “to set the records straight.”

Since the Sweeper was a commercially available piece of equipment, it was always supplied as a retrofit kit or in a complete turn-key instrument. This meant that such a standard system was delivered with a modulation capillary containing a non-polar stationary phase with a film thickness of 3 or 3.5 μm , mounted (i.e., glued in the factory) on a bracket. In essence, it was therefore possible only to maintain the trapping temperature of the Sweeper at the same value as that of the GC oven—that is, unless major adaptations were carried out. It was this standard retrofit kit that was described and discussed in our paper [2]. Gaines and Frysinger, on the other hand, have indeed shown that the

application range of the Sweeper can be extended, but only by using a distinctly modified and adapted system. In order to extend the upper limit of application, they incorporated a thin-film (thickness, 0.5 μm) modulation capillary in a separate, heated zone that was 40 °C cooler than the first-dimension column [9]. If the application range had to be extended to lower boiling compounds, the authors used sub-ambient cooling of the GC oven [10]. Only under such conditions could the application range be extended beyond what, in our opinion, is and should be called the standard range of the device. We therefore propose that, when the application capabilities of the Sweeper are discussed in some detail, the possible extension of that range is indicated by referring to the pertinent publications [9,10].

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