

A Reply to Criado, Malet, Munuera, and Rives-Arnau

We are pleased to note that the accompanying letter by Criado, Malet, Munuera, and Rives-Arnau (1), and their 1980 article, confirm shape index calculations of Ibok and Ollis (3) for three of four cases:

- (i) first-order desorption without readsorption,
- (ii) first-order desorption with equilibrated readsorption,
- (iii) second-order desorption without readsorption.

We acknowledge a sign error in a computer program calculation of the shape index for the fourth case:

- (iv) second-order desorption with equilibrated readsorption.

This error was noted and corrected by Ibok (4) in his recent thesis (May 1981).

The importance of this correction is properly noted by Criado *et al.* (1): it means that a single TPD shape index measurement corresponding to an initial coverage $\theta_0 = 1.0$ probably cannot comfortably distinguish between second-order desorption with equilibrated readsorption and first-order desorption without readsorption.

We also noted earlier (3), as did Criado *et al.* (2), that the variation of S with θ_0 could assist in determination of kinetic order and the presence or absence of readsorption. The variation of S with E or ΔH noted in Fig. 2 of the Criado *et al.* (1) letter diminishes the ease of interpretation of TPD data, although their original Table 4 (2) shows that, independent of E (or ΔH), S will be constant for variations in θ_0 when readsorption is negligible for either first- or second-order desorption. An experimental example

using ammonia desorption from porous glass takes advantage of this model feature (4).

Finally, yet an additional variation of S arises with nonuniform surfaces. This topic is discussed in a recent paper (5).

We note with curiosity the use of the words "previous" and "previously" in the Criado *et al.* letter. Our paper was presented in November 1979 at the AIChE meeting (Chicago, paper 18e), submitted on January 14, 1980, and published in December of 1980. The "previous" Criado *et al.* paper was submitted on October 15, 1979 and published on May 15, 1980. Thus, these parallel and independent derivations are but an example of the principle of "parallel discovery" common in fields of appreciable activity.

REFERENCES

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3. Ibok, E., and Ollis, D. F., *J. Catal.* **66**, 391 (1980).
4. Ibok, E., Ph.D. thesis, Princeton University, May 1981.
5. Ibok, E., and Ollis, D. F., submitted for publication.

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