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**ADVANCED  
TECHNOLOGY PROGRAM**

**Chemical Manufacturing for the 21st  
Century: Challenges and Benefits**

**Focused Program  
Development Workshop  
NIST**

**April 29, 1994  
8 a.m. - 5 p.m.**

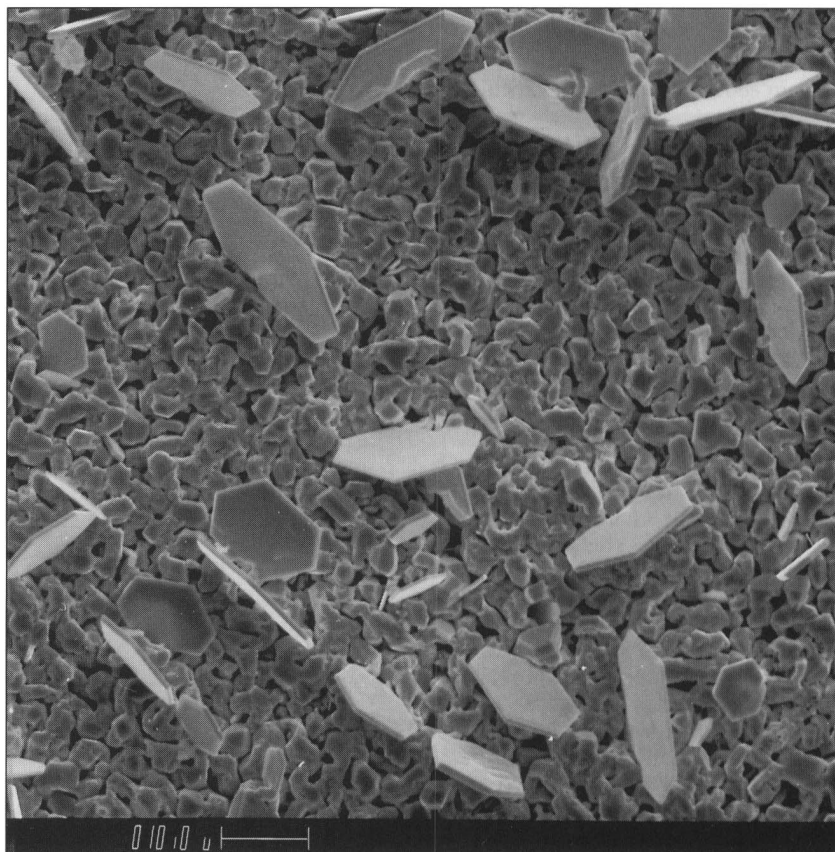
**Objective:** To provide an open forum for discussion of (1) technical and business issues of importance to the chemical process industries and (2) R&D directions that might be the basis for an ATP program. The meeting is not intended to identify specific technical approaches that might be submitted for program competitions.

For registration information, call L. Phillips at (301) 975-4513.

For mailing list and general ATP information, contact the ATP Office at (800) 287-3863; e-mail [atp@micf.nist.gov](mailto:atp@micf.nist.gov); FAX (301) 926-9524.

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Figures appearing in the EDITOR'S CHOICE are those arising from materials research which strike the editor's fancy as being aesthetically appealing and eye-catching. No further criteria are applied and none should be assumed. When taken out of context, such figures often evoke images beyond and unrelated to the original meaning. Submissions of candidate figures are welcome and should include a complete source citation, a photocopy of the report in which it appears (or will appear), and a reproduction-quality original drawing or photograph of the figure in question.



Sometimes one stumbles across a single image that, on prolonged study and reflection, reveals a hierarchy of prophetic nested symbols that speak not merely to its own origin but have profound and sweeping philosophical significance. What is your first reaction to this month's EDITOR'S CHOICE? Just a granulated surface of some sort littered with chads of some other sort? These chads, however, are multifaceted (six to be precise). They have clearly not just floated down to their resting place. Most are standing at angles closer to the surface normal than to the plane, as though embedded by intent, yet they are apparently placed at random. A "litterature" search would soon disclose that the flakes should not, by all that was known prior to volume 4 of *Chemistry of Materials*, pages 538-544, even exist. But then came page 543, when this scanning electron micrograph exposed crystallites of the hexagonal compound,  $Ni_3B_3$ , which formed well above 500°C, a temperature where it is not supposed to be stable. Of course, the mundane details of the CVD film deposition process from a reaction of borane gas with nickel chloride and the subsequent high-temperature annealing protocol used by the researchers, S.S. Kher and J.T. Spencer, would illuminate from the technical side of the formation question. Understanding that the litter grew in place from the seedbed (and hotbed) of a film, rather than resulting from thoughtless scofflaws camping out on the otherwise pristine surface of an off-stoichiometric, boron-rich, nominally  $Ni_3B$  steppe, raises the process from misdemeanor to one of grand design. In its own unique way, this image embodies the high calling and very essence of science itself—the pursuit of truth regardless of its palatability and possible political consequences. It gives life to the old nostrum, applied in a speech\* nominating General Ulysses Simpson Grant to a third term as U.S. president: "...He will hew to the right, let the chips fall [or grow] where they may."

\*Roscoe Conkling, Chicago, June 5, 1880.