

Using Microscopy in Failure Analysis to Inspire Students

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In his 2006 State of the Union address, President Bush included the words:

“We need to encourage children to take more math and science, and to make sure those courses are rigorous enough to compete with other nations.”

One path toward this goal is to introduce students to a world which is likely very new to them – a world which is revealed by the powers of various modern microscopes. Additional enthusiasm is generated when students use microscopes to investigate real world failures. Thus, the motivation and significance is readily apparent.

The ASM Materials Camp program matches small groups of high school students with practicing materials scientists and engineers in their local communities. The students work side by side with their hosts during a week long program spent in the classroom, library, and laboratory. They prepare a report and presentation of their findings.

In Summer, 2005, a special arrangement with NASA allowed students in the Chicago area to examine artifacts from the Space Shuttle Columbia. With support from the local high school and media, this experience inspired not only the students participating, but also their classmates and the larger community.

It is recognized that young people do and should make career decisions based not only on their personal passions, but economic considerations as well. However, if they have not taken the necessary prerequisites in high school and early college, they may be effectively precluded from rewarding scientific, engineering, or other technical careers later on.

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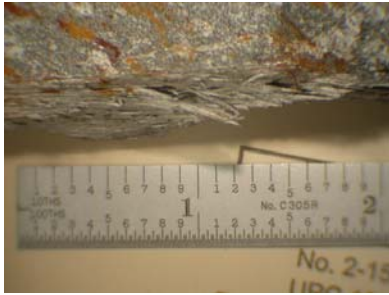


Fig. 1. “Woody fracture”

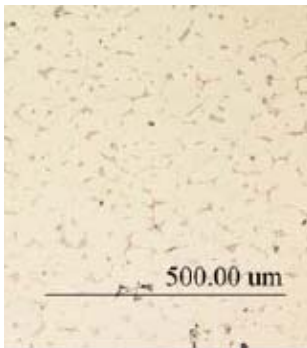


Fig. 2. Incipient melting in Al microstructure

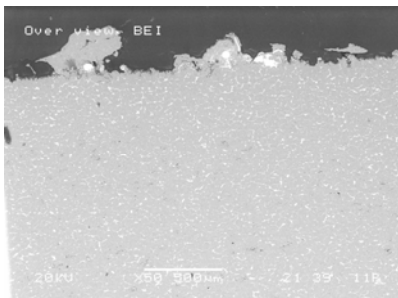


Fig. 3. Mixture of metals on surface.



Fig. 4. High school students study ASM Handbooks



Fig. 5. Local high school support.



a.



b.

Fig. 6. Interest from local media.