

Seeing Through Metallic Glass Terminology

To the Editor:

Kurt Nassau's letter in the [MRS Bulletin 1995] July issue asserts that the term "metallic glass" has been "preempted by an incorrect use for a group of materials properly called 'glassy metals.' The adjective should describe the unusual characteristic, while the noun should indicate the essential nature of the material." Then why don't we speak of "glassy windows"? Or "steel alloys"? Or glassy silicates, phosphates, or borates? The point is that Nassau's rule is not useful because "the essential nature of the material" is in the eye of the beholder.

At the time that Ho-su Chen invented the first practical metallic glasses which

have since become important soft-magnetic materials, many hours were spent debating terminology. The need was to name these new materials as concisely and descriptively as possible. It was decided, by yours truly, the holder of trump at the time, that the most important characteristic of these materials is their genesis: the fast quenching of their liquids. This quenching suppressed long-range internal structure, which leads to some unique properties, and it led to high casting through-put which meant low manufacturing costs.

This choice was not without problems because people strongly associate "glass" with transparency in spite of the fact that many "quenched liquids" are not transparent, and not all transparent materials are

glasses (some of the first windows were crystalline mica). It was felt that the commonly misused word "amorphous" was to be avoided because these materials, as well as most glasses, are not "without structure" as the Greek root of "amorphous" demands. Also, it was felt that "vitreous," and its variations, was too specialized.

Later, the tradename, "METGLAS" was a natural by-product of the "metallic glass" name.

Hence, I must disagree with Kurt Nassau regarding the propriety of calling these materials, "metallic glasses." Their genesis and internal structure is their essence.

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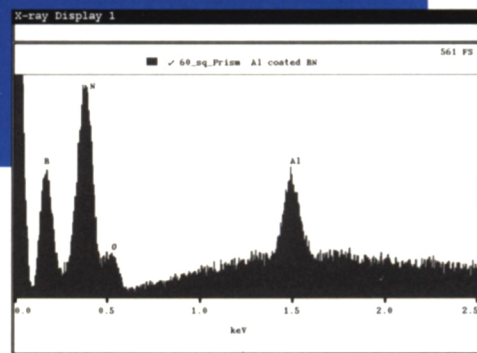
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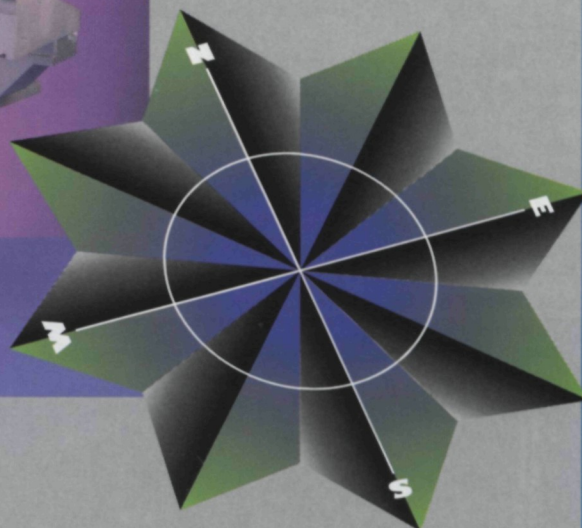
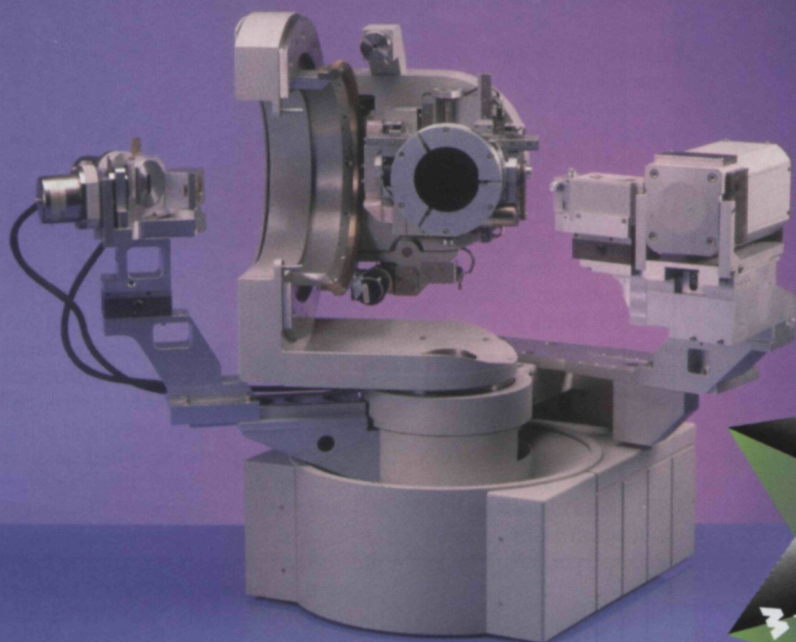
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