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Indentation Testing for Materials Characterization of Crystalline Solids

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Message from the Guest Editor

Indentation or hardness testing is increasingly used for material characterization at different length scales and for very different materials. The main advantage is, of course, the simplicity of such testing, but more than that, the fact that indentation can be performed on very thin specimens, pertinent to thin films and coatings, and also on very hard materials. The disadvantage is that the mechanical problem resulting at the indentation is very complicated, and the correlation of different indentation quantities with material properties is difficult, but also necessary. This is particularly so for crystalline solids, where often, elastic and plastic deformations are of equal magnitude below the indentation contact region, in contrast to the situation for metals, where plasticity is completely dominating and elasticity is irrelevant. Accordingly, the present Special Issue concerns the correlation of indentation experiments, based on empirical, theoretical, and numerical analyses, resulting in closed form relations. Different kinds of indenter geometries, such as pyramid, conical, and spherical ones, are of interest.

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Message from the Editor-in-Chief

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