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Abstract content
 (Max 300 words)

There is a continuous demand for improved efficiency of engines, plants and production processes. For this reason, ceramics have gained an ever increasing importance as engineering materials. In the group of advanced materials, carbon in the form of diamond, carbides, nitrides and borides have reached an outstanding position due to their excellent hardness, chemical and mechanical properties, particularly at high temperatures.

There is extensive work in the development of new hard materials, aimed at competing with diamond, not just in hardness, but in cost-effectiveness in general.

This paper covers some of the cutting edge work done at present in this area and then focuses on the work done in our laboratories. This covers work on polycrystalline diamond, cubic boron nitride, boron suboxide and other hard oxides and nitrides. A great deal of this activity was focused on the development of hard and ultrahard materials at low pressures (<70 MPa), as opposed to the traditionally ultrahigh pressures used in the synthesis and sintering of such materials.

The materials made using this approach are evaluated with regard to their industrial applicability in manufacturing and occasionally oil and gas drilling processes.

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