

INDUCTION PLASMA SYNTHESIS AND PROCESSING OF NANOSTRUCTURED MATERIALS

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A review will be presented of recent developments in the area of plasma synthesis of nanostructured powders using induction plasma technology. These are based on the in-flight vaporization and of precursor powders followed by the rapid condensation of the formed metal vapors. The use of organo-metallic precursors will also be discussed as well as the potential use of reactive quench techniques for the syntheses of nanostructured ceramic powders. The further handling and consolidation of such powders using standard sintering techniques or high velocity plasma spraying offers a number of challenges because of the high reactivity of the powders. Special attention has to be given to the problem of grain growth which can result in a serious degradation of the properties of the consolidated body whether it is in the form of a structural part or a protective coating. Examples will be given for different metallic and ceramic material identifying their potential and research needs.