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Synthesis of $Ti_{50}Ni_{50}$ alloy nanopowders synthesized by modified levitational gas condensation method

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Abstract. The stoichiometric $Ti_{50}Ni_{50}$ alloy nanopowders were synthesized by levitational gas condensation (LGC) using micron powder feeding system and their particulate properties were investigated by X-ray diffraction (XRD), transmission electron microscopy (TEM) and Brunauer- - Emmett-Teller (BET) method. The starting Ti and Ni micron powders ~ 150μm were incorporated into the micron powder feeding system. The ingot type of Ti-Ni alloy was used as a seed material for levitation and evaporation reactions. The collected powders were finally passivated by oxidation. The x-ray diffraction experiments have shown that the synthesized powders were completely alloyed with 50Ti and 50Ni in at.% and comprised of two different cubic and monoclinic crystalline phases. The TEM results showed that the produced powders were a very fine and uniform with the spherical particle size of 18 to 32 nm. The typical thickness of passivated oxide layer on the particle surface was about 2 to 3 nm. The specific surface area of the Ti-Ni alloy nanopowders was 54.8 m^2/g based on a BET method.