

## Effects of heat treatment on the magnetic properties of melt-spun Nd<sub>6</sub>Pr<sub>1</sub>Fe<sub>76</sub>B<sub>12</sub>Ti<sub>4</sub>C<sub>1</sub>Co<sub>3</sub> nanocomposite ribbons

### ABSTRACT

In this study, the effects of different annealing temperatures on the structure and magnetic properties of Nd-Fe-B nanocomposite permanent magnetic alloys with nominal composition of Nd<sub>6</sub>Pr<sub>1</sub>Fe<sub>76</sub>B<sub>12</sub>Ti<sub>4</sub>C<sub>1</sub>Co<sub>3</sub> have been investigated. Melt Spinning (one of the most predominant ribbon synthesize methods) with constant wheel speed of  $V = 25$  m/s was employed to produce ribbons. As-spun ribbons were examined by using xray diffractometer (XRD) with Cu-K radiation and differential scanning calorimetry (DSC). The ribbons were annealed at different temperatures in order to extract the best magnetic properties. The XRD and electron microscopy technique results confirm that grains are in the size of less than 50 nm. In addition, optimum magnetic properties were obtained at 720°C annealed temperature.

**Keyword:** Heat treatment; Melt-spun; Nanocomposite; Nd-Fe-B