

Thermomechanical processing of Fe₂VAl-based compounds for thermoelectric applications.

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Harvesting low grade heat from industrial applications through the thermoelectric effect would be economical and environmentally friendly. However, for those applications, thermoelectric materials should be produced on a large scale. The present study investigates (Fe₂/3V₁/3)100-yAl_y compounds and their thermoelectric properties. Tuning the aluminum content brings about p- and n-type materials with optimised Seebeck coefficients. The investigated processing route consists in casting the elements in desired proportions before rolling the ingot into a sheet. However, the poor ductility of the Fe₂VAl intermetallic compound requires preparation steps prior to rolling. The parameters of the specific thermomechanical treatments that need to be applied to give some ductility to the intermetallic compound were identified and optimised. Their influence on the microstructure and functional properties has also been examined. Finally, the occurrence, but also the influence, of the ordering phenomenon was studied.

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