HYDROSTATIC TRAINING AND CHARACTERIZATION OF NEAR STOICHIOMETRIC Ni-Mn-Ga ALLOY"

ENG / NOUR MAHMOUD EL-DABAH[1]
ASSOCIATE. PROF. DR. / SALEH KAYETBAY[1,3]
ASSOCIATE. PROF. DR. / MOHAMED ABD EL-HADY GEPREEL[2]
PROF. DR. / AHMED. M. EL-ASSAL[1]

ABSTRACT

Shape memory alloys are programmed to memorize original trained shape. Ni Mn Ga is one of the ferromagnetic shape memory alloys. It is used as actuator, and sensor due to large output strain at high frequencies. This work presents a study on enhancing magnetic properties of thermally treated alloy by using new method of training. Single near stoichiometric composition was produced. Elemental analysis showed homogeneity of the alloy. XRD pattern revealed Martensitic phase peaks. Transformation temperature was found to be below 100 C^O. Training was applied by hydrostatic pressing die. Different training pressures were obtained using hydraulic press. After applying hydrostatic pressures stating from 2.5 bar to 10 bar, it was found that pressures up to 7.5 bar will the coercivity and saturation magnetization of the alloy, while loads beyond 7.5 bar lessened these magnetic properties.

KEYWORDS

Shape memory alloys, Ni-Mn-Ga., Martensite twins, Hydrostatic training, Magnetic properties measurements.

_____

1. Mechanical Engineering Department, Benha Faculty of Engineering, Benha University, Benha Egypt
2. Department of Materials Science and Engineering, Japan University of Science and Technology (E-JUST), Alexandria, Egypt.
3. Engineering of Technical Mechanical Department, Al-Amara College University, Maysan, Iraq