

## Preparation of Alumina (Al<sub>2</sub>O<sub>3</sub>) Particles and MMCS of (Al-7% Si- 0.45% Mg) Alloy Using Vortex Method

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**Abstract :** The aim of this research is to study the manner of alumina (Al<sub>2</sub>O<sub>3</sub>) particles dispersion with (2-10) mm size in (Al-7%Si-0.45% Mg) base of alloy melt employing of classical casting method. The mechanism of particles diffusions by melt turning and stirring that makes vortexes help the particles entrance in the matrix of base alloy also has been studied. The samples of metallic composites (MMCs) with dispersed particles percentages (4% - 6% - 8% - 10% - 15% and 20%) are prepared. The effect of the particles dispersion on the mechanical properties of produced samples were carried out by tension & hardness tests. It is found that the ultimate tensile strength of the produced composites can be increased by increasing the percentages of alumina particles in the matrix of the base alloy. It becomes (232 Mpa) at (20%) of added particles. The results showed that the average hardness of prepared samples increasing with increases the alumina content. Microstructure study of prepared samples was carried out. The results showed particles location and distribution of it in the matrix of base alloy. The dissolution of Alumina particles into liquid base alloy was clear in some cases.

**Keywords :** base alloy, matrix, hardness, thermal properties, base metal MMCs

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