

Abstract High-entropy alloy is a new alloy which is different from traditional alloys. The high entropy alloys were started in TsingHua University of Taiwan since 1995 by Yeh et al. Consisting of a variety of elements, each element occupying a similar compared with other alloy elements to form a high entropy. We could define high entropy alloys as having approximately equal concentrations, made up of a group of 5 to 11 major elements. In general, the content of each element is not more than 35% by weight of the alloy. During the investigation it turned out that this alloy has a high hardness and is also corrosion proof and also strength and good thermal stability. In the experimental area, scientists used different tools, including traditional casting, mechanical alloying, sputtering, splat-quenching to obtain the high entropy alloys with different alloying elements and then to investigate the corresponding microstructures and mechanical, chemical, thermal, and electronic performances.

The present study is aimed to investigate the corrosion resistance in a different medium acid and try to put in evidence the mechanical properties. Forasmuch of the wide composition range and the enormous number of alloy systems in high entropy alloys, the mechanical properties of high entropy alloys can vary significantly. In terms of hardness, the most critical factors are: hardness/strength of each composing phase in the alloy, distribution of the composing phases. The corrosion resistance of an high entropy alloy was made in acid liquid such as 10% HNO_3 -3% HF , 10% H_2SO_4 , 5% HCl and then was investigated, respectively with weight loss experiment. Weight loss test was carried out by put the samples into the acid solution for corrosion. The solution was maintained at a constant room temperature. The liquid formulations used for tests were 3% hydrofluoric acid with 10% nitric acid, 10% sulfuric acid, 5% hydrochloric acid. Weight loss of the samples was measured by electronic scale.