ABSTRACT

The purpose of this study is using 2202 metallurgical-grade silicon as raw material, after being crushed by crusher and separated by power magnetic separator, silicon powder by the diameter of 0.2~0.5 and 0.5~0.7 mm would be sieved for the usage of this experiment. Under the condition of ultrasonic vibration, by changing the acid types and concentration, leaching time and different particle sizes, to study the effect of removing metal impurities from silicon powder. After leached by HCl, HNO3, H2SO4, HF and the different ratios of combined acid, the equipment of ICP-OES is used to analyze the composition of leaching powder, which compared the variation of Fe, Al and Ca impurities. From experimental results showed that with a single type of acid (HCl, HNO3, H2SO4) using, the removal rate of Al, Ca, Ti is less effective than HF, which also showed outstanding results in removing all other metallic impurities. Therefore, the HF exist the best leaching efficiency than any other types of acid. With increased the leaching time, the tendency of total impurities content decreased, the purity of silicon powder up to 99.96 wt.%. If want to lower the content of Fe, Al and Ca without using the HF acid, we can select the combined acids with the mixing ratio of 1 HNO3 and 5 HCl which have the best efficiency of removing the impurities, up to the 99.9 wt.% grade (3N).