# Optimisation efficiency of alloyed aluminum on their application as sacrificial anode based on metal found in Indonesia

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Abstrak

The purpose of this research was to find other material to be alloyed to aluminum which is cheap, not a dangerous compound, which can be carted as simple as possible and should be as far as possible found in Indonesia.

Tin, zinc, and indium, are metals to be alloyed which were reported gave a better performance to aluminum sacrificial anode, although the latest mentioned is difficult to be found in Indonesia. The alloying was done by simple casting.

The investigation started with alloying aluminum with 5% Zn , and tin added in varying weights from of 0.004, 0.006, 0.008, 0.01, 0.04, 0.1, to 0.2 percent. The second was also 5% Zn and Indium in varying weights as from 0.004, 0.005, 0.02, 0.05, 0.07, to 0.08 percent.

Anode potential, cathodic protection potential, the capacity of anode, anode output, anode efficiency, the anode corrosion patron and induction time were points being investigated to know the anode performance, gained by immersed test in 3% sodium chloride solution.

The efficiency of 77 % can be obtained from 5% Zn and 0,1 % Sn aluminum alloy and for comparison, 5% Zn and 0.05% indium aluminum alloy can reach an efficiency of 86 %.

The Sn, Zn aluminum alloys, have an anode potential of -1.15 volt, cathodic protection potential -1,06 volt , capacity of 2558 A.h/kg, while the Indium, Zn aluminum alloy has -1.155 volt anode potential, capacity of 2543 Ah/kg , and anode out put of 4.76 ampere. During the immersion time Al-Zn-Sn alloys give more stable cathodic protection potential.