Effect by electrolysis for dissolution and precipitation of calcite in flow system.

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1. Introduction

The technique which electrolysis was used for is put to practical use as one of the countermeasures against the calcium carbonate scale adhesion by the heat water circulation.

Then, the case which the calcium carbonate which stuck to the pipe dissolved in was seen with the system which used electrolysis.

Dependence such as that pH was looked for in search of the speed that calcium carbonate stuck to the speed that calcium carbonate dissolves by the electrolysis by the pipe, the electrolysis device by this research.

2. Experiment

An electrolysis device was put in the water tank of 50L, and water was made to circulate with 15L/min in the pipe inside where the stainless plate which calcium carbonate stuck to was installed.

A solution was examined with 2 kinds of solutions that Ca concentration was 0 and 100m g/L.

And, the experiment which made an electrolysis device work, and an experiment by the un-operation were done.

A change such as pH in the solution and Ca concentration was measured.

A change in weight in the stainless plate after it passes for 120 hours was asked.

The amount of scale adhesion of electrode cover was found.

The average weight change speed of around the unit area was found from these values.

3. Result

Regardless of the electrolysis device, CaCO3 of the stainless plate dissolved at a speed of g/m2/s in CaCO3 0.035m in case of a solution of the un-saturation, and it was 7.2 several hours after it was examined, and pH became a constant.

On the other hand, the definite difference due to the electrolysis was seen with the solution saturated in CaCO3.

When a device wasn't made to work, CaCO3 stuck to the stainless plate at a speed of g/m2/s from the solution of the over-saturation 0.0088m more.

But, when a device was made to work, CaCO3 dissolved at a speed of 0.069 mg/m2/s from the stainless plate.

At this time, CaCO3 stuck to the electrode cover with g/m2/s 0.25m, and pH of the solution decreased from early 8.0 to 6.3 at the same time.

It was shown more than this that CaCO3 dissolved from the stainless plate with the electrode though it was over-saturation in CaCO3 when it was made to supply current.

Then, it was shown that it happened due to the pH decrease of the solution when CaCO3 sticks to the electrolysis device in that dissolution.

It became the result which it was shown that it has the effect which makes the calcium carbonate scale which it has already stuck to by electrolysis' using how to deal with it than this in the pipe of the circulation dissolve in.