

## Q&A

**21Q1: What kind of advantage can we have, when we change the coagulant from aluminum sulfate to PAC (poly-aluminum chloride)? (Ms. S. K, Thailand)**

**A:** This question is about consideration for changing coagulant from aluminum sulfate (alum) to PAC (poly-aluminum chloride). Both of those chemicals are excellent in coagulation for the most kinds of turbidity. Most of water treatment plants in Japan use either aluminum sulfate or PAC. In the case of alum, liquid type is commonly used rather than solid one because of usability, and used in a warm climate region because this type sets in a cold climate easily.

It has been said that PAC, compared to aluminum sulfate, has advantage in the respects of wide range of proper pH for coagulation, wide acceptable range of proper dosing rate, effectiveness of coagulation in high and low turbidity water, amount of alkali consumption and settling velocity of floc. Therefore, PAC is used in water treatment plants which have water source where the water quality fluctuates widely. On the other hand, water treatment using PAC requires proper chemical dosing such as pH control because there might remain aluminum in the water treated by PAC. Moreover, it might cost more because there is a tendency of too much use of coagulant because of its convenience.

The effect of coagulant is affected by not only the kind of coagulant but also water quality such as turbidity, color, pH, organic matters, algae and temperature. Therefore, when you consider the change of coagulant, you need to see following procedures.

- 1) To recognize the feature of raw water.
- 2) To clarify the purpose of treatment.
- 3) To understand the characteristic of coagulant
- 4) To conduct proving test and verify its effects.
- 5) To consider the conditions for implementation including cost.

For the experiment;

You determine the target of quality value of treated water and then examine the effect of treatment by jar-test. If necessary, you conduct the small-scale plant experiment. And then you consider it comprehensively.

Although the surface water in Southeast Asia is high turbid, both of those coagulants would work enough effectively there because the water temperature is high.

Even if you use better coagulant, you cannot expect to get good result without appropriate use and coagulation-sedimentation process.

**(Answerer: Mr. KUDO Yukio, Japan Water works Association, 2009)**