

## Separation of sumi ink using micro ultracentrifuge

CS-GXII series micro ultracentrifuge and S100AT4 angle rotor

Sumi ink sticks are made of oil soot, pine soot and glue. By rubbing such a sumi ink stick with a bit of water, a black liquid called sumi ink can be made. Oil soot is obtained by burning vegetable oil and pine soot is obtained by burning pine chips. Such soot cannot be sedimented by centrifuges whose RCF is only several tens of thousands of x g in most cases. Following is our experiment report on separation of three kinds of sumi ink on the market by centrifugation at 500,000 x g for 1 hour.

### Experiment

#### 1. Sample

- ① "Suminosei No. 11" (Boku-undo Co., Ltd.)
- ② "Suminosei No. 8" (Boku-undo Co., Ltd.)
- ③ "Bokuteki" (Kuretake Co., Ltd.)

#### 2. Conditions for centrifugation

Centrifuge: CS150GXII micro ultracentrifuge  
Rotor: S100AT4 angle rotor (Six tubes)  
Tube: 3PC tube (Actual capacity: 2.7 ml)  
Speed: 100,000 rpm (Maximum RCF: 541,000 x g)  
Time: 1 hour  
Temperature: 20°C  
Amount of sample: 2.7 ml

#### 3. Result



①



②



③

#### 4. Explanation

Sample①: Not all particles were sedimented and suspended particles were found in the supernatant. This sample is made of “mineral oil soot” and the size of soot is 20 nm. As a result of the above experiment, it is expected that the S100AT4 angle rotor can sediment particles at 100,000 rpm in about 2 hours.

Sample②: Almost all particles were sedimented under the above conditions for centrifugation. The microparticle diameter is assumed to be about 30 to 50 nm (this sample is made of “mineral pure pine soot”).

Sample③: All particles were sedimented completely. It is assumed that microparticles whose diameter is several tens of nanometers are not included in the sample.

Thus an ultracentrifuge operable at hundreds of thousands of x g is helpful in separation, sedimentation and concentration of microparticles included in sumi ink.

#### Instruments



CS150GXII micro ultracentrifuge



S100AT4 angle rotor

For more information, visit our website at:

<http://www.hitachi-koki.com/himac.contact/index.htm>

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