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Separation of paint using ultracentrifuge

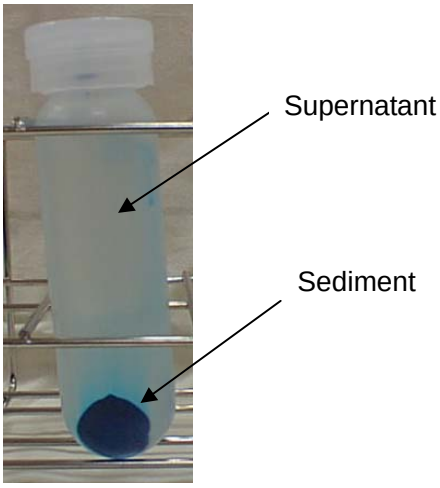
CP-WX series preparative ultracentrifuge and P70AT angle rotor

Pigment components contained in paint are microparticles and ordinary centrifuges cannot sediment such microparticles sufficiently. Furthermore, pigment components have become increasingly microparticulated as small as several tens of nanometers in diameter in tandem with the recent technological advances in particle fabrication. To separate such nanometer-sized microparticles, an ultracentrifuge that is operable at RCF is 100,000 x g or higher RCF is very helpful. Following is our experiment report on separation of about 25 ml of sample contained in one bottle at 105,000 x g. The P70AT angle rotor used in this experiment can handle eight 25-ml bottles at a time (200 ml). It is also possible to separate 300 ml of sample at a maximum by using another rotor that can handle twelve bottles at a time.

Experiment

1. Conditions for centrifugation
   Centrifuge: CP100WX preparative ultracentrifuge
   Rotor: P70AT angle rotor (Eight tubes)
   Bottle: 30PA bottle (actual capacity: 26 ml)
   Speed: 32,000 rpm
   Maximum RCF: 105,000 x g
   Time: 40 minutes
   Temperature: 10°C
   Sample: Blue paint

2. Result



3. Explanation

The size of particles sedimented in the above experiment is assumed to be about 50 to 100 nm (assumed that the particle density is 1.2 g/cm^3, the solvent is distilled water (density 1 g/cm^3, viscosity 0.01 P) and the particle configuration is perfect sphere). Our preparative ultracentrifuge can process a few hundred milliliters of paint sample at a time to separate 50 to 100-nm particles of pigment components.

Instruments

CP100WX preparative ultracentrifuge

P70AT angle rotor

For more information, visit our website at:
http://www.hitachi-koki.com/himac.contact/index.htm

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