

## 9. Magnetic Separation of Sucrose Disaccharide and Sorbitol Monosaccharide (Video 17)

### <Explanation>

Using the effect of magneto-Archimedes levitation, powder mixtures of sucrose disaccharide and sorbitol monosaccharide were magneto-levitated and separated. In this experiment, the effect of levitation was intensified by utilizing the approximately 8.2% difference in mass susceptibility between sucrose and sorbitol (both diamagnetic), and by the effect of magneto-Archimedes levitation for compressed oxygen (paramagnetic). The video shows a flocculation of sorbitol in the upper part and sucrose in the lower part. Particles can be seen floating around the flocculation, but they are sucrose and/or sorbitol floating and mutually repulsing from the effect of static electricity.

**Video 17** shows the behavior of floating sucrose and sorbitol made to fall down sequentially by lowering the flux density from 12.7 T at the rate of 0.110 T per minute. Since the falling particles are affected by the horizontal component of the magnetic force in axially symmetry mode, it looks like they are falling along an hourglass-shaped curve. This curve shows a good coincidence with the magnetic force distribution obtained by numerical calculation.

### <Place of execution>

National Institute for Materials Science (NIMS)

### <Research paper>

S. Maki, and N. Hirota,

“Magnetic separation technique on binary mixtures of sorbitol and sucrose”,

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