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# *MODEL DEMONSTRATION OF BROWNIAN MOTION*

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To perform the demonstration it is necessary to take three or four of the smallest ceramic magnet rings used in schools (their outside diameter is approximately 10 mm) and to break up each ring into six pieces with flat-nose pliers. The magnet pieces obtained in this manner are placed in a low cylindrical vessel with transparent bottom and cover, something like a Petri dish. To obtain the Brownian motion, a piece of rubber stopper, of approximate diameter 12 mm and height 5—6 mm, is placed in the dish. The rubber piece should be chosen of a size such that it can acquire an easily seen motion when the pieces of ceramic magnet collide with it. The Petri dish with the ceramic magnets and the rubber stopper are then placed on the upper part of a vertically oriented solenoid made up of 15—20 turns of copper wire of 4 $mm^2$ cross section. The solenoid diameter is best chosen to be 1—2 cm smaller than the diameter of the Petri dish, so as to be able to place the dish on the solenoid and to pass a light beam along the axis of the solenoid and project the experiment on a screen. If an alternating current of 18—20 A is made to flow through the solenoid winding, the pieces of ceramic magnet will begin to move randomly inside the Petri dish, with an approximate velocity 2—2.5 m/sec. They will collide with the rubber stopper and push it in different directions. The random motion of the ceramic magnets simulates the motion of the gas molecules no less naturally than in A. A. Eichenwald's well known experiment for simulating Brownian motion, but the experiment with ceramic magnets is much easier to perform.

If the pieces of ceramic magnets are placed in a dish with a shallow layer of liquid that is to be stirred, and the vessel is fastened at the upper end of the solenoid, then the magnet pieces will move randomly through the volume of the liquid and stir it. To produce stirring in corrosive liquids, the ceramic magnets should be fused into glass envelopes. Such a magnetic mixer produces more effective stirring than the ordinary magnetic mixer with a rotating magnetic field.

Translated by J. G. Adashko