

Manual for accessory kit to electromagnetic vibrator no. 2185.55

14.12.10

Ae 2185.55

Description

This accessory kit to electromagnetic vibrator (2185.00) is very suitable for demonstration of the different phases. The kit comprises 48 steel balls illustrating molecules or atoms. The bottom in the chamber consists of a vibrator plate, which is mounted on the centre pin on the Vibrator, as shown on figure 1. By activating the vibrator the balls, illustrating molecules or atoms, will be set in motion, and depending on the frequency of the vibrator plate, it is easy to illustrate solid, liquid and gas phase. By means of the enclosed piston-plate, pressure in the chamber can be simulated. Furthermore the Brownian movements can be illustrated using the enclosed aluminium-disks.

Finally the kit contains a mounting bracket for use with an overhead projektor.

The complete kit comprises:

- 1 chamber with 48 steel balls.
- 2 screws for mounting the chamber to the vibrator.
- 1 piston-plate.
- 1 vibrator plate.
- 1 zip-bag with four aluminium disks.
- 1 mounting bracket for use with overhead projektor.

Additional equipment necessary:

- Electromagnetic vibrator, 2185.00.
- Test leads.
- Functions generator, 2500.50 or 2501.50.

Assembly of the kit:

Start by locking the centre tap on the vibrator by means of the locking pin.

Figure 1.



The kit is mounted on the vibrator as illustrated on figure 1. Be aware that the vibrator plate must be fed into the slit in the bottom of the chamber. The piston plate is only used for illustrating pressure in the chamber.

Instructions for use:

Connect the vibrator with a function generator or a continuously adjustable AC power supply (AC 0-5 V, 50 Hz). Start at a low frequency and low amplitude. Change the frequency and/or the amplitude and see how the steel balls are behaving. When the energy applied to the steel balls is increased, their movement will increase to. Thus an impression of how a solid material changes its phases from solid via liquid to gaseous by heating can be had. If a more "spectacular" demonstration of boiling is required, the top lid can be removed by un-screwing the two chromed finger-screws on the top of the chamber. In this way the steel balls will be thrown out of the chamber when illustrating boiling. (fig. 2)

Figure 2



Use of the piston plate



Figure 3.

By inserting the piston plate in the slit in the lid of the chamber it can be illustrated how the pressure performed by the steel balls is increased as the applied energy is increased. Also one can see how the increased energy (for example by heating a gas) is able to perform a physical work, exemplified by the piston in a Stirling engine.

Use of the aluminium disks

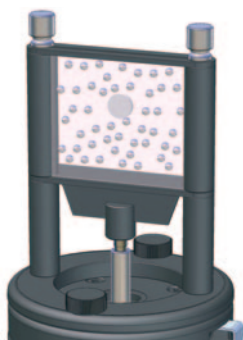
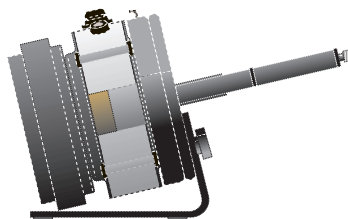


Figure 4

The lid of the chamber can be removed by unscrewing the two chromed finger-screws on the top of the chamber. In this way one or more of the enclosed aluminium disks can be placed in the chamber, and the term Brownian Movements can easily be illustrated.

Using the mounting bracket for Overhead projector

Figure 5



For demonstrating to a class, the equipment most convenient can be mounted on the enclosed bracket. This is mounted by unscrewing one of the screws used to mount the chamber on the vibrator. The hole in the bracket is placed over the now empty screw-hole, and the screw is re-fitted. Please note that the bracket is supplied with rubber feet to protect the glass plate on the overhead projector.

Maintenance:

The equipment does not require any particular maintenance.

Spare parts

Steel balls, bag with 200 pcs. Part no.: 1997.90.

Piston-plate: Part no.: 2185,5506.