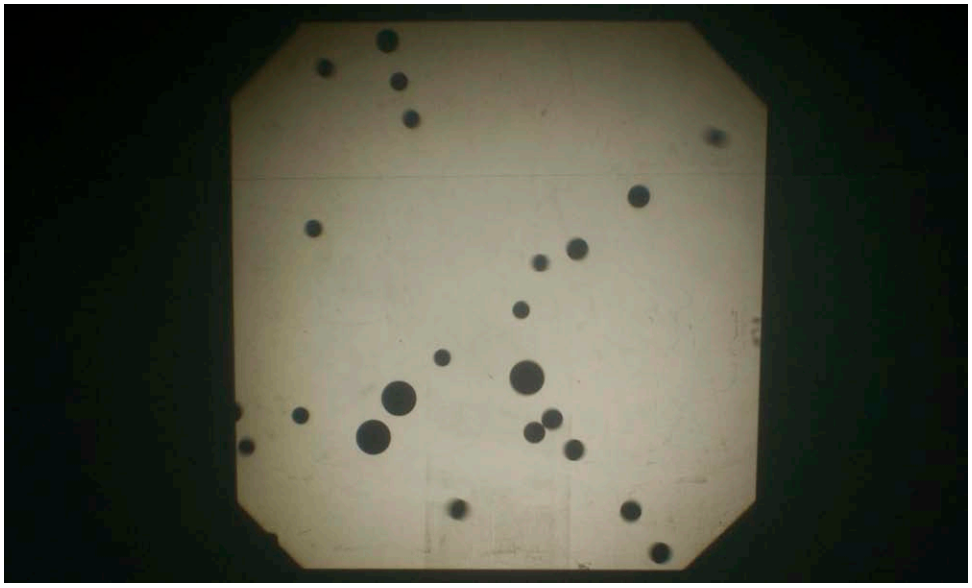
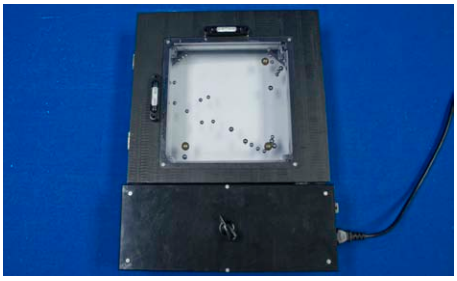
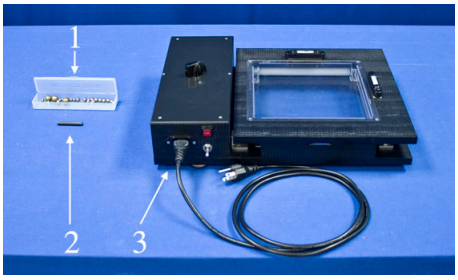
MOLECULAR MOTION SIMULATION 4D30.20

Thermodynamics | Kinetic Theory | Kinetic Motion







Concept:

The more massive balls are seen to move more slowly as expected. Also as the rotational speed of agitator bars is increased, simulating an increase of the temperature of a gas, the mean velocity of all the balls increases. The demonstration can also be used to illustrate that, for equal numbers of balls per unit volume, the larger balls have a smaller mean free path than the smaller balls.

Equipment:

1. Box of 10 Small Balls, 10 Medium Balls and 3 Large Balls
2. Small Magnet
3. Molecular Motion Demonstrator
4. Overhead Projector (not pictured)

Procedure:

1. Place all of the balls in the demonstrator's viewport and use the adjustable feet to level it on the overhead projector.
2. Turn on the overhead projector and toggle the power switch on the side of the demonstrator to turn it on.
3. Slowly rotate the black knob to adjust the rotational speed of the agitator bars.
4. If required, initially incline the demonstrator to one side to get the balls to roll and strike the agitator bars.
5. Notice that, the smaller balls have a higher mean velocity while the larger balls have a lower mean velocity.
6. Notice that the mean velocity of all balls is proportional to the rotational speed of the agitator bars.