

Measuring the atmospheric pressure

AIM:

To measure the atmospheric pressure in Jonkoping today, by a simple lab.

APPARATUS:

One plastic hose.
Water (colored with MnO_4^-).
A bucket.

THEORY:

$$P = \frac{F}{A} = \frac{mg}{A} = \frac{v \cdot \rho \cdot g}{A} = \frac{A \cdot h \cdot \rho \cdot g}{A} = h \cdot \rho \cdot g$$

PROCEDURE:

First, we filled a bucket and the hose with the colored water. Then my friend went down to the ground level and I to the second floor to drop a rope so that he could tie the rope to the hose. The lower end of the hose was in the colored water so that the water should stay inside the hose all the time.

When I pulled the upper end of the hose to my level, the upper edge of the colored liquid suddenly stopped at a certain height. We measured the height from the upper edge to the surface of the water in the bucket to 10.3m (see fig.1) And the putted it into the formula.

DATA:

H=10.3

RESULT:

$10.3 \cdot 1000 \cdot 9.82 = 101146 \text{ Pa} = 101.146 \text{ kPa}$.

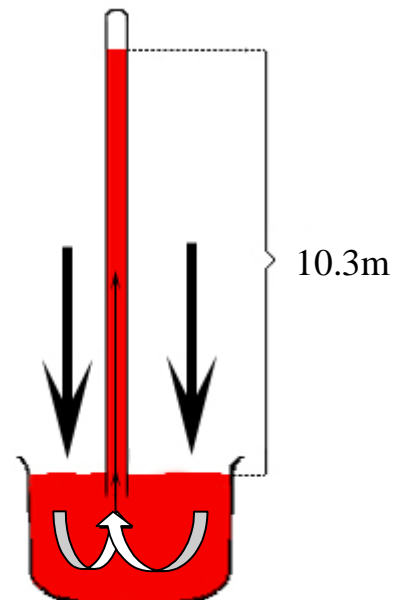


Fig. 1