Experiment 27: Vacuum Dust Sampling

SYNOPSIS: Dust is sampled using a filter and vacuum. The advantage of this method is a smaller amount of material to be digested.

Materials:

Personal air sampling pump (an aquarium pump may serve)
0.8 µm pore size, 37-mm diameter cellulose ester filter
filter holder
tweezers
tubing 0.60 cm inside diameter
powderless gloves
soap bubble calibration device
tape

Method

1. In the lab calibrate the air flow by the pump with a soap bubble (see next page). The flow rate should be 1-5 L/min calibrated to 5%.
2. Keep note of the calibration of the pump within the lab book.
3. Put on the powderless gloves
4. Assemble the collection filter device, consisting of the filter holder and filter paper. Seal the filter holder with plastic tape and label.
5. Attach the 0.60 tubing to the top of the filter capsule. The end of the tubing should be cut to a 45 angle.
6. Attach the 0.60 cm i.d. tubing to the bottom of the filter capsule and to the pump. The distance should be greater than 5, but less than 10 cm.
7. Place the template (1 ft square i.d. disposable cardboard) on the surface and tape down.
8. Move the Nozzle across the surface (in contact but without pressure) with the 45 cut flat on the surface at a rate of 10 to 20 cm/s. Vacuum entire surface in a side to side motion.
9. Repeat but at a 90 degree angle from the first vacuuming.
10. Repeat at the original direction.