

EXERCISE 21

SOLIDS IN CIGARETTE SMOKE

Objective:

To determine solid content in cigarette smoke.

There is evidence that smoking is a direct cause of lung cancer. More than 40 carcinogens have been identified among the 4000 compounds found in cigarette smoke. Smoke contains carbon monoxide which reacts with hemoglobin forming carboxyhemoglobin. Carboxyhemoglobin is more stable than oxyhemoglobin, that is why carbon monoxide lowers the oxygen carrying capacity of the blood. This increases the strain on the heart causing high blood pressure. In addition, cigarettes contain solids which when inhaled destroy lung tissue causing emphysema and chronic bronchitis.

Equipment:

1. suction flask
2. cigarettes
3. water pump

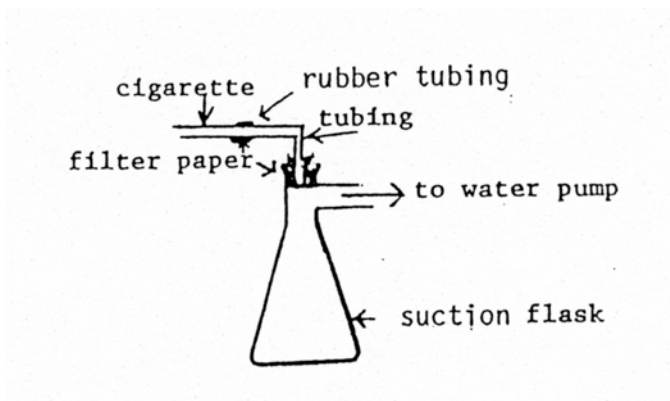


Figure 21-1

Procedure:

1. Set up apparatus as shown in figure (21-1). Weigh the filter paper to the nearest 0.01 g. Return the filter paper to the apparatus.
2. Obtain a non-filter cigarette from the stock room and weigh it to the nearest .01 g. Attach a cigarette to the apparatus as shown in the figure and adjust water pump to burn cigarette in 3-5 min.
3. After the cigarette has been consumed, turn off the water pump and weigh the remainder of the cigarette with ashes.
4. Calculate the weight of the cigarette consumed.
5. Weigh the filter paper.
6. Calculate the weight of solids on filter paper.
7. Repeat the experiment for the filter cigarette and report results on the answer sheet.
8. Repeat the experiment for the small cigar and report results on the answer sheet.

EXERCISE 21

ANSWER SHEET

NAME _____ SECTION _____

DATE _____ SAMPLE _____

	<u>Non-Filter Cigarette</u>	<u>Filter Cigarette</u>	<u>Cigar</u>
1. Weight of filter paper	_____	_____	_____
2. Weight of cigarette or cigar	_____	_____	_____
3. Weight of part of cigarette not consumed	_____	_____	_____
4. Weight of cigarette consumed	_____	_____	_____
5. Final weight of filter paper	_____	_____	_____
6. Weight of solids on filter paper	_____	_____	_____
7. Calculate percent of solids retained by the filter	_____	_____	_____