

Extra Toxicology Problems

1.

By mass, only 0.25% of an oleander leaf is poison(oleandrin). The lethal dose for oleandrin is 0.50 mg/kg. Each leaf weighs 3.0 grams. What is the smallest number of leaves that will be lethal for a 100 kg adult?



$$100 \text{ kg}(0.50 \text{ mg/kg}) = 50 \text{ mg}$$

50 mg is 0.25% of what mass of leaves?

$$50 = 0.0025x$$

$$X = 20000 \text{ mg} = 20 \text{ g}$$

$$20\text{g (leaf/3.0g)} = 6.7, \text{ almost 7 leaves}$$

2. Use the following table to answer the questions that follow:

SUBSTANCE	TOXIC DOSE(mg of poison/kg of body mass)
Bromide(Br-)	1000
Chloroform (CHCl ₃)	160
Valium(diazepam)	12
Benadryl	10
Strychnine	2

a) Which of the above substances is the most toxic and why?

Strychnine is the most poisonous because it takes so little to cause harm.

b) Do seven 2 mg Valium tablets constitute a toxic dose for a 75 kg patient? Why or why not?

$$75 \text{ kg} * (12 \text{ mg/kg}) = 900 \text{ mg}$$

$$7 \text{ tablets} * (2 \text{ mg/tablet}) = 14 \text{ mg}$$

Since $14 \text{ mg} \ll 900 \text{ mg}$, it is nowhere near a toxic dose.

c) Why does the lethal dose for chloroform have to be greater than 160 mg/kg?

The lethal dose is always greater than the toxic dose. A toxic dose causes physiological damage but does not cause death immediately.

d) For a 30 kg child, the recommended dosage of benadryl is 7.5 ml. The bottle says that each 5 ml of benadryl contains 12.5 mg of the drug. What is the ratio of the recommended dose to the toxic dose? Express as a percentage.

$$7.5 \text{ ml} * (12.5 \text{ mg}/5 \text{ ml}) = 18.75 \text{ mg}$$

$$\text{Recommended dose} = 18.75 \text{ mg}/30 \text{ kg} = 0.625 \text{ mg/kg}$$

$$\text{Ratio} = 0.625 \text{ mg/kg} : 10 \text{ mg/kg}$$

$$0.625/10 * 100\% = 6.3 \%$$