Unit 18 · Chemistry in the Service of Mankind

WORKSHEET

Full marks 37

Name _____ Class _____ Roll no. _____ Date _____ Marks _____ / 37

1 Key words [3]

Write True or False in the box beside each sentence. Correct each false sentence. Each carries 0.5 mark.

i. Every medicine is a drug, but not every drug is a medicine. ☐

ii. Bakelite is a thermoplastic. ☐

iii. An auxochrome gives a dye its color. ☐

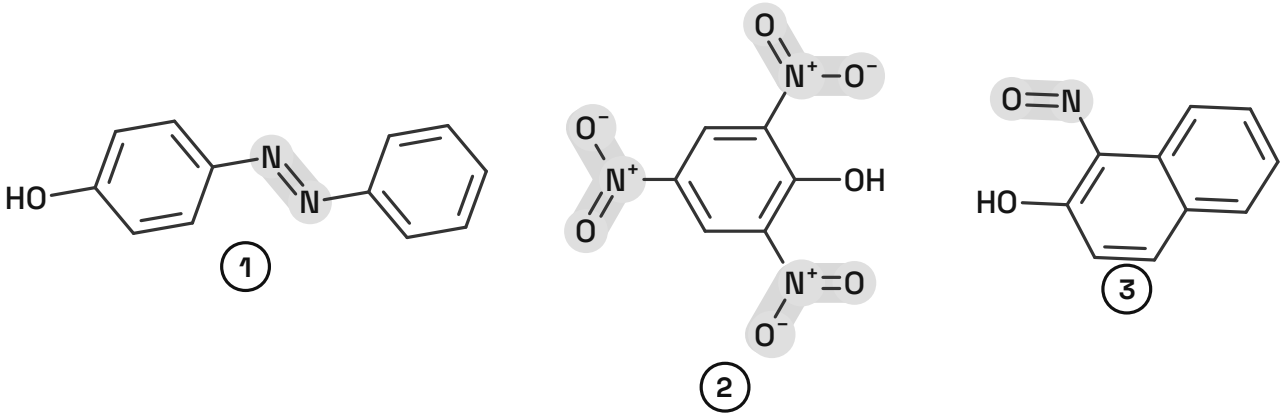
iv. A 0.2% solution of phenol is an antiseptic, and a 1% solution a disinfectant. ☐

v. Antibiotics treat infections caused by viruses. ☐

vi. Nylon-6,6 is a condensation copolymer. ☐

2 Label the diagram [3]

The diagram shows three dyes, each named for its chromophore. Write the name of each dye and its class in place of 1 to 3. Each carries 1 mark: 0.5 for the dye's name, 0.5 for its class.



1. _____ **2.** _____

3. _____

3 Multiple choice [5]

Choose the correct option for each of the following questions.

i. The monomer of Teflon (PTFE) is: [1]

a. chloroethene **b.** tetrafluoroethene

c. styrene **d.** ethene

ii. Which of these is a condensation polymer? [1]

a. PVC **b.** polystyrene

c. PET (Terylene) **d.** polythene

iii. Indigo, which colors denim, is applied to cotton as a: **[1]**

a. direct dye **b.** mordant dye
c. vat dye **d.** disperse dye

iv. Which of these is a broad-spectrum antibiotic? **[1]**

a. penicillin G **b.** vancomycin
c. chloramphenicol **d.** paracetamol

v. Bordeaux mixture, sprayed on potatoes and grapes, is a: **[1]**

a. herbicide made of 2,4-D
b. fungicide made of copper sulphate and slaked lime
c. insecticide made of DDT
d. rodenticide made of zinc phosphide

4 Short answers **[11]**

Write short answers to the following questions.

a. Distinguish addition from condensation polymers, with one example of each and its monomers. **[2]**

b. What is the difference between an antiseptic and a disinfectant? Give one example of each. **[2]**

c. How does antibiotic resistance arise, and how can it be slowed? **[2]**

d. Write balanced equations for the reactions of the antacids sodium hydrogencarbonate and magnesium hydroxide with stomach acid. **[2]**

e. Acid dyes, basic dyes and direct dyes are named by how they are applied. For each, say what charge its colored part carries (or how it holds) and which fibers it suits. **[3]**

5 Long answer **[4]**

Write a long answer to the following question.

What are pesticides? Name the four groups of pesticides with one example of each, and write two benefits and two harmful effects of using them.

6 Numerical problems **[8]**

Solve the following problems. Show your working. Take H = 1, C = 12, N = 14, O = 16, Na = 23, Mg = 24, and the molar volume of a gas at STP as 22.4 L.

a. An antacid tablet contains 500 mg of magnesium hydroxide. i. How many moles of HCl can it neutralize? ii. What volume of stomach acid, taken as 0.10 M HCl, is that? iii. Another tablet has 840 mg of sodium hydrogencarbonate: what volume of CO_2 (at STP) does it give in the stomach? iv. Gram for gram, which antacid neutralizes more acid, and how many times more? **[4]**

Answer:

b. Nylon-6,6 is made from hexanedioic acid, $HOOC(CH_2)_4COOH$, and hexane-1,6-diamine, $H_2N(CH_2)_6NH_2$. i. Write the equation for its formation. ii. Find the molar mass of its repeat unit, $–OC(CH_2)_4CO–NH(CH_2)_6NH–$. iii. What masses of the two monomers are needed to make 1.00 kg of nylon-6,6, and what mass of water is given off? iv. A sample of polythene has a molar mass of 56,000 g/mol. How many ethene units are in one chain? **[4]**

Answer:

7 Think **[3]**

Ethene and benzene are colorless, but methyl orange, whose azo group joins two benzene rings into one long conjugated system, is colored. In alkali it looks orange-yellow. Explain why, and say which part of white light it absorbs.

8 Activity: Polymers at home (not marked)

Find six things at home made of a polymer (a bucket, a water pipe, a rope, a switch, a non-stick pan, a school uniform…). Use the unit to fill in the table.

Object	Polymer	Monomer(s)	Addition or condensation?	Softens when heated?

Which of them would you put next to a flame, and why?