Year 13 Science: Polyesters, polyamides, proteins and fats

Name: _____ Date: _____

Try these without your notes first, then check the answer key.

Practice

1. What small molecule is lost when ethane-1,2-diol and benzene-1,4-dicarboxylic acid form PET?

2. Give the products when nylon-6,6 is heated under reflux with HCl(aq).

3. How many different dipeptides can be made from one glycine and one alanine?

4. Give the products when glyceryl tristearate (a fat) is heated with NaOH(aq).

5. Which amino acid is not chiral?

Exam-style question: PLA and nylon

PLA cups are made from lactic acid, $CH_3CH(OH)COOH$. Nylon-6,6 can be made from hexane-1,6-diamine and hexanedioyl dichloride, $ClOC(CH_2)_4COCl$.

6. Name the type of polymerisation that forms PLA, and the type of link in it.

7. Explain why lactic acid exists as enantiomers.

8. Give the organic product when PLA is heated under reflux with NaOH(aq).

9. Name the small molecule released when nylon-6,6 is made from the dichloride.

10. Explain why the dichloride route is faster than using hexanedioic acid.

Fix the mistake

11. Correct this statement: "The repeating unit of a polyester is just the ester link -COO-."

12. Correct this statement: "Glycine and alanine can only make one dipeptide."

13. Correct this statement: "Saponification of a fat gives glycerol and three fatty acids."

14. Correct this statement: "Condensation polymers form when C=C bonds break open."