Materials Practice Test

**1.** Describe the action of charged particles, such as Al3+ in the water treatment process of flocculation

/3

**2.** A soap molecule CH3(CH2)4CHCH(CH2)6COO- was produced from a triglyceride

1. Draw the structure of this triglyceride

/2

1. Describe how you can determine whether this triglyceride will be a fat or an oil

/2

1. Systematically name the by-product of the reaction that produces soap

/1

1. This reaction is an example of a basic hydrolysis, what name is given to this specific reaction?

/1

1. Describe how this soap molecule enables it to dissolve grease

/3

**3.** Part of a polymer is shown below

 O O

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(– C – (CH2)3 – O – C – (CH2)3 – O – )

1. Draw the monomer for this polymer

/2

1. What type of polymerisation reaction is required to form this polymer

/1

Another type of monomer is shown below

 NH2 – (CH2)3 – NH2

1. Name the other type of monomer that would be required to form an amide polymer with this monomer

/1

1. Using these two monomers, draw 2 repeating units of a polymer (assume 1 carbon between functional groups for the monomer from c)

/3

1. This polymer has a melting range of 290 – 300oC, why would it not have a precise melting point

/2

1. Describe why the melting range of this polymer would be higher than polyethylene (- CH2 –CH2 - )

/3

1. Polyethylene is a plastic polymer, what does this mean?

/1

1. Draw the monomer for polyethylene

/2

1. How do the properties of a polymer change with cross linking

/2

**4.** Tripolyphosphates can be used as additives in cleaning products

1. Draw the Linear tripolyphosphate anion P3O105-

/2

1. Write the molecular formula of the magnesium salt of this ion

/2

1. Would this compound be a solid, liquid or gas?

/1

1. State the arrangement of oxygen atoms around each phosphorus atom

/1

1. Describe 3 advantages of using tripolyphosphates with detergents

/3

1. Describe an environmental concern for the use of tripolyphosphates

/2

**5.** Silicates are the main component of many soils

1. Write the formula for the anion of MgAl2(SiO3)4

/2

1. Calculate the charge on the anion Al3Si2O10.3H2O

/2

1. Calculate the percentage of silicon atoms that have been replaced by aluminium in the previous aluminosilicate

/2

**8.** HOCl is commonly used as a bleach and is much more powerful than elemental chlorine.

1. Name this chemical

/1

1. With reference to the following equation, describe why chlorine bleaches are more effective at pH > 7.

Cl2(aq) + 2H2O(l) ⇌ HOCl(aq) + H3O+(aq) + Cl-(aq)

/4

9. Zeolites are used to soften hard water.

1. Describe how zeolites act as water softeners

/3

1. Describe, using an equation, how the zeolite can be “regenerated” by a strong solution of sodium chloride

/3