Learning Tracker; Polymers and Life

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|

|  |
| --- |
| **SPECIFICATION HEADINGS** |

 | **R** | **Y** | **G** |
| **STRUCTURE AND BONDING**  |  |  |  |
| **Recall** the structure of amino-acids and their zwitterions |  |  |  |
| **Describe** proteins as condensation polymers formed from amino-acid monomers |  |  |  |
| **Techniques** and procedures for paper chromatography **(PAG 6)** |  |  |  |
| **Describe** the different levels of protein structure explaining the importance of intermolecular bonds |  |  |  |
| **Describe** and **explain** how the intermolecular bonds in secondary and tertiary protein structures determine the properties of proteins  |  |  |  |
| **Recall** DNA and RNA as condensation polymers made up of monomers with three components (nucleotides) |  |  |  |
| **Explain** the significance of hydrogen bonding in the base pairing in DNA and RNA and **relate** this to the encoding of genetic information. |  |  |  |
| **Describe** the process of transcription and translation. |  |  |  |
| **Describe** the process of molecular recognition in terms of the pharmacophore of a drug molecule, the interaction with an active site in numerous dimensions. |  |  |  |
| **KINETICS** |  |  |  |
| **Describe** and **explain** the shape of a rate v. substrate concentration curve for enzyme catalysed reactions |  |  |  |
| **Describe** and **explain** the characteristics of enzyme catalysis including specificity, temperature, pH and competitive inhibition. |  |  |  |
| **EQUILIBRIA (ACID-BASE)** |  |  |  |
| **Recall** the acidic nature of carboxylic acids, and their reaction with metals, alkalis and carbonates |  |  |  |
| **Recall** the acid*–*base properties of amino acids and their existence as zwitterions |  |  |  |
| **Recall** the basic nature of the amino group; the reaction of amines with acids **(PAG 7)** |  |  |  |
| **ORGANIC FUNCTIONAL GROUPS** |  |  |  |
| **Recall** and **recognise** the formulae and systematic nomenclature of members of the following homologous series:carboxylic acids, phenols, acyl chlorides, acid anhydrides, esters, aldehydes, ketones, diols, dicarboxylic acids, primary amines, diamines.  |  |  |  |
| **Determine** the name of nylons by analysis of their structure |  |  |  |
| Recall and recognise the formulae for the following functional groups: primary amide, secondary amide |  |  |  |
| **ORGANIC REACTIONS** |  |  |  |
| **Describe** the products of the hydrolysis of esters and amides by both aqueous acids and alkalis, including salt formation where appropriate |  |  |  |
| **Recall** the reactions of acyl chlorides with amines and alcohols as a techniques to form amides in a lab setting **(PAG 7)** |  |  |  |
| **POLYMERS** |  |  |  |
| **Understand** the differences between addition and condensation polymerisation |  |  |  |
| **Link** the relationship between the structural formula of a condensation polymer and the structural formulae of its monomer(s) and *vice versa* |  |  |  |
| **ISOMERISM** |  |  |  |
| **Draw** diagrams to represent optical stereoisomers of molecules |  |  |  |
| **Identify** those atoms and molecules that are described as chiral in relation to optical isomerism |  |  |  |
| **Describe** enantiomers as non-superimposable mirror image molecules |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **MODERN ANALYTICAL TECHNIQUES** |  |  |  |
| **Use** IR and mass spectra to **identify** key parts of an organic molecule (see also WM) – including the use of high res mass spectra to identify specific molecules. |  |  |  |
| **Analyse** and **interpret** proton and carbon-13 nuclear magnetic resonance (NMR) spectra for the determination of molecular structure |  |  |  |
| **Analyse** and **interpret** splitting patterns up to quartets for proton NMR using the ‘*n* + 1’ rule; (further explanation of splitting **not** required) |  |  |  |
| **Determine** the structure of organic molecules the combination of spectroscopic techniques (mass spectrometry, IR and NMR) |  |  |  |

**How can I improve?**

|  |  |
| --- | --- |
| 1 |  |
| 2 |  |
| 3 |  |
| 4 |  |
| 5 |  |