**ANSWERS: Cracking**

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| **2019** | **Evidence** | **Achievement** | **Merit** | **Excellence** |
| (i)(ii)(iii) | Cracking. It is necessary to provide alkenes that can be used to make polymersC7H16 --> C5H12 + C2H4(accept condensed or expanded)C15H32 --> C8H18 + 2C2H4 + C3H6 | • Cracking or produce alkenes. | • Links cracking to producing an alkene.• One Correct equation. | • Both correct balancedequations. |

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| **2018** | **Evidence** | **Achievement** | **Merit** | **Excellence** |
|  | C6H14 --> C4H10  + C2H4 |  |  |  |

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| **2017** | **Evidence** | **Achievement** | **Merit** | **Excellence** |
| (i)(ii) | Decane → Pentane + Propene + EtheneC10H22 → C5H12 + C3H6 + C2H4Cracking is a chemical reaction in which carbon to carbon bonds within the molecule are broken to form smaller hydrocarbons. This requires either high temperatures and pressures, or the use of a catalyst to break the carbon to carbon bonds. New products are formed, so this is a chemical process.Fractional distillation is a physical process where hydrocarbons are separated based on their physical properties (boiling points). No new substances are formed – the mixture is separated into different fractions based on mass / boiling point, therefore the process is physical.The two processes are different as cracking produces new products while fractional distillation is used to separate a mixture. | • One product correct.• States that cracking is a chemical process and fractional distillation is a physical process.• Describes what cracking /fractional distillation is. | • All products correct.• Explains why one process is achemical or physical process. | • Contrasts both processes; including reference to thephysical / chemical properties of the hydrocarbons involved. |

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| **2016** | **Evidence** | **Achievement** | **Merit** | **Excellence** |
|  | ass90932aQ3c1_1Reaction 1 is cracking. The conditions required are heat, pressure, catalyst. | * THREE out of four names / structures correct.
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| **2015** | **Evidence** | **Achievement** | **Merit** | **Excellence** |
| (i)(ii) | Catalyst, heat, pressure.C12H26 → 2C2H4 + C8H18 | * States one condition required.

 • Gives correct formulae of products.  |  |  |

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