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Cambridge IGCSE Chemistry 0620 style

ORGANIC CHEMISTRY – MARK SCHEME

Maximum mark: 44 (Core: 35). ";" separates marking points. Accept correct alternative wording. Extended-only parts: 2(e), 2(f), 3(e), 5(b), 5(d).

Question	Answer	Marks	Guidance
1(a)	a mixture of hydrocarbons;	1	allow: crude oil; do not allow: "a fuel" alone
1(b)	column is hot at the bottom and cooler at the top / temperature gradient; fractions condense at different heights because they have different boiling points;	2	allow: vapour rises and each fraction condenses where the temperature is below its boiling point
1(c)(i)	F;	1	
1(c)(ii)	D;	1	
1(c)(iii)	C;	1	
1(d)	viscosity increases;	1	allow: gets thicker / less runny
1(e)(i)	methane;	1	allow: CH_4
1(e)(ii)	$CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$ CO_2; 2 (in front of O_2);	2	balancing mark only if CO_2 is correct
2(a)	B;	1	
2(b)	D;	1	
2(c)	ethanol;	1	do not allow: ethenol / ethanal
2(d)	(add) bromine water / aqueous bromine; A: stays orange / no change; B: turns (from orange to) colourless / decolourised;	3	allow: brown / yellow for orange do not allow: "clear" for colourless
2(e)	C_nH_{2n};	1	
2(f)	same molecular formula; different structural formula / different arrangement of atoms;	2	do not allow: "different displayed formula" alone if it only means drawn differently
3(a)	high temperature; catalyst;	2	allow: named catalyst e.g. aluminium oxide / silica; allow 450–600 °C
3(b)	C_2H_4;	1	do not allow: $2CH_2$

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Question	Answer	Marks	Guidance
3(c)	any two from: more demand for small molecules / petrol than large ones; makes alkenes (used to make polymers / ethanol); makes hydrogen (for ammonia / fuel);	2	allow: "supply of large molecules is greater than demand"
3(d)(i)	ethanol;	1	
3(d)(ii)	any two from: 300 °C; 6000 kPa / 60 atm; acid catalyst / phosphoric acid;	2	allow: 250–350 °C; allow: high pressure; allow: catalyst
3(e)	addition; ethane;	2	allow: hydrogenation for type of reaction
4(a)	glucose; carbon dioxide;	2	allow: sugar for glucose; allow CO_2
4(b)	any two from: yeast; 25–35 °C / warm; no oxygen / anaerobic; aqueous glucose / in water;	2	allow: any temperature from 25 to 35 °C do not allow: "hot" or "heat strongly"
4(c)	uses a renewable raw material / sugar from crops / low temperature so less energy needed;	1	do not allow: "cheaper" alone
4(d)	$C_2H_5OH + 3O_2 \rightarrow 2CO_2 + 3H_2O$ $2CO_2$ and $3H_2O$; $3O_2$;	2	second mark only if the first is correct
5(a)(i)	bubbles / fizzing / magnesium gets smaller / disappears;	1	do not allow: "gas given off" alone or "hydrogen made"
5(a)(ii)	magnesium ethanoate;	1	
5(b)(i)	ethyl ethanoate;	1	
5(b)(ii)	(concentrated) sulfuric acid;	1	allow: acid catalyst
5(c)	two carbon atoms joined by a single bond, each with two H atoms; bonds extending out of brackets on both sides (and n);	2	do not allow: C=C in the repeat unit for the first mark
5(d)	any two from: addition: only one product / the polymer only, condensation: a small molecule (e.g. water) is also made; addition uses monomers with C=C, condensation uses monomers with two functional groups; condensation often uses two different monomers;	2	must be a comparison; one point each for any two differences

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