

- 1 Arrange water, ethanol ($\text{CH}_3\text{CH}_2\text{OH}$), and hexane (C_6H_{14}) in order of increasing specific heat ($\text{J/g/}^\circ\text{C}$).
 - A hexane < water < ethanol
 - B ethanol < water < hexane
 - C hexane < ethanol < water
 - D water < ethanol < hexane
- 2 Arrange water, ethanol ($\text{CH}_3\text{CH}_2\text{OH}$), and hexane (C_6H_{14}) in order of increasing molar heat capacity ($\text{J/mol/}^\circ\text{C}$).
 - A hexane < water < ethanol
 - B ethanol < water < hexane
 - C hexane < ethanol < water
 - D water < ethanol < hexane
- 3 If equal masses of water, ethanol, and hexane are heated for the same amount of time, which will be coolest?

Table 1.1 Molar heat capacities and specific heats for selected compounds

Compound	Formula	Molar mass, g/mol	Molar heat capacity, $\text{J/mol}\cdot^\circ\text{C}$	Specific heat, $\text{J/g}\cdot^\circ\text{C}$
water	H_2O	18	75.3	4.18
ethanol	$\text{C}_2\text{H}_5\text{OH}$	46	112.1	2.44
hexane	C_6H_{14}	86	182.4	2.12
benzene	C_6H_6	78	128.1	1.64
acetone	$\text{C}_3\text{H}_6\text{O}$	58	129.1	2.21
methanol	CH_3OH	32	81.1	2.53
glycerol	$\text{C}_3\text{H}_8\text{O}_3$	92	160.1	1.71

- A water
 - B ethanol
 - C hexane
 - D They will all be the same temperature
- 4 If equal volumes of water, ethanol, and hexane are heated for the same amount of time, which will be coolest?

Table 1.1 Molar heat capacities and specific heats for selected compounds

Compound	Formula	Molar mass, g/mol	Molar heat capacity, $\text{J/mol}\cdot^\circ\text{C}$	Specific heat, $\text{J/g}\cdot^\circ\text{C}$
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- 5 If equal moles of water, ethanol, and hexane are heated for the same amount of time, which will be coolest?

Table 1.1 Molar heat capacities and specific heats for selected compounds

Compound	Formula	Molar mass, g/mol	Molar heat capacity, J/mol·K	Specific heat, J/g·K
water	H ₂ O	18	75.3	4.18
ethanol	C ₂ H ₅ O	46	112	2.44
hexane	C ₆ H ₁₄	98	182	1.85
benzene	C ₆ H ₆	78	128	1.65
acetone	C ₃ H ₆ O	58	129	2.21
methanol	CH ₃ OH	32	81	2.51
propanol	C ₃ H ₇ OH	74	138	1.87

- A water
 B ethanol
 C hexane
 D They will all be the same temperature