

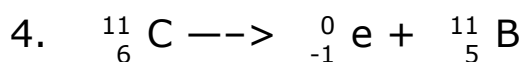
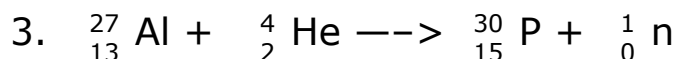
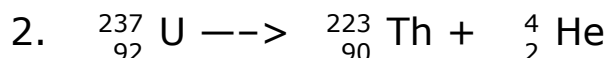
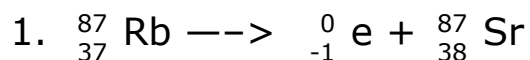
Over the past 2 years the chemistry department has examined the part 1 answers of the Regents to determine what questions were the hardest for most of our students. Those would be topics we should spend a bit more time on.

What follows is a compilation the difficult questions, which I hope to help you with.

From June 2005

20. Systems in nature tend to undergo changes toward
1. lower energy and lower entropy
 2. lower energy and higher entropy
 3. higher energy and lower entropy
 4. higher energy and higher entropy
8. At STP, solid carbon can exist as graphite or diamond. These two forms of carbon have
1. the same properties and same crystal structure
 2. the same properties and different crystal structure
 3. different properties and same crystal structure
 4. different properties and different crystal structure
15. Compared to a 0.1 M aqueous solution of NaCl, a 0.8 M aqueous solution of NaCl has a
1. higher boiling point and a higher freezing point
 2. higher boiling point and a lower freezing point
 3. lower boiling point and a higher freezing point
 4. lower boiling point and a lower freezing point

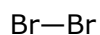
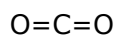
32. Which equation represents a fusion reaction?



34. Which symbol represents a particle that has the same total number of electrons as S^{2-} ?

1. O^{2-}
2. Si
3. Se^{2-}
4. Ar

40. Which molecule contains a non-polar covalent bond?



41. According to reference table G, which substance forms an unsaturated solution when 80 grams of the substance is dissolved into 100 grams water at 10°C ?

1. KI
2. KNO_3
3. NaNO_3
4. NaCl

49. Given the balanced ionic equation $\text{Zn}_{(s)} + \text{Cu}^{+2}_{(aq)} \rightarrow \text{Zn}^{+2}_{(aq)} + \text{Cu}_{(s)}$

Which equation represents the oxidation half reaction?

1. $\text{Zn}_{(s)} + 2e^{-} \rightarrow \text{Zn}^{+2}_{(aq)}$
2. $\text{Zn}_{(s)} \rightarrow \text{Zn}^{+2}_{(aq)} + 2e^{-}$
3. $\text{Cu}^{+2}_{(aq)} \rightarrow \text{Cu}_{(s)} + 2e^{-}$
4. $\text{Cu}^{+2}_{(aq)} + 2e^{-} \rightarrow \text{Cu}_{(s)}$

From 2006

49. What is the half life of sodium-25 if 1.00 grams of a 16.00 gram sample remains unchanged after 237 seconds?

1. 47.4 sec
2. 59.3 sec
3. 79.0 sec
4. 118 sec

50. Proposed models of the atom:

Model A: protons in nucleus, electrons in specific shells

Model B: protons in nucleus, electrons in regions of most probably location

Model C: protons dispersed throughout the atom, electrons in specific shells

Model D: protons dispersed throughout the atom, electrons in regions of most probably location

Which model correctly describes the locations of protons and electrons in the wave-mechanical model of the atom? A, B, C, or D?

43. What is the IUPAC name for the compound that has a condensed structure of $\text{CH}_3\text{CH}_2\text{CH}_2\text{CHO}$?

1. butanol
2. butanal
3. propanol
4. propanal

4. Atoms of different isotopes of the same element differ in their total number of

1. electrons
2. neutrons
3. protons
4. valence electrons

5. Which statement correctly describes two forms of oxygen, O_2 and O_3 ?

1. they have identical molecular structures and identical properties
2. they have identical molecular structures and different properties
3. they have different molecular structures and identical properties
4. they have different molecular structures and different properties

17. Which formula represents a hydrocarbon?

1. $\text{CH}_3\text{CH}_2\text{CH}_2\text{CHO}$
2. $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_3$
3. $\text{CH}_3\text{CH}_2\text{CH}_2\text{COOH}$
4. $\text{CH}_3\text{CH}_2\text{COOCH}_3$

23. Which balanced equation represents a redox reaction?

1. $\text{AgNO}_3 + \text{NaCl} \rightarrow \text{AgCl} + \text{NaNO}_3$
2. $\text{BaCl}_2 + \text{K}_2\text{CO}_3 \rightarrow \text{BaCO}_3 + 2\text{KCl}$
3. $\text{CuO} + \text{CO} \rightarrow \text{Cu} + \text{CO}_2$
4. $\text{HCl} + \text{KOH} \rightarrow \text{KCl} + \text{HOH}$