Advanced Chemistry Milestones

Chemistry · Answer Key · 20 Questions

1. In which year did Linus Pauling publish his seminal book 'The Nature of the Chemical Bond'?

A) 1932
B) 1939
C) 1945
D) 1951

2. What is the value of the Faraday constant, representing the charge per mole of electrons, in Coulombs per mole (rounded)?

A) 86400
B) 96485
C) 102400
D) 112000

3. Dmitri Mendeleev presented his first periodic table to the Russian Chemical Society in which year?

A) 1863
B) 1869
C) 1875
D) 1881

4. How many valence electrons does a neutral atom of Gallium (atomic number 31) possess in its ground state?

A) 1
B) 2
C) 3
D) 4

5. The Avogadro constant is defined as exactly how many entities per mole?

A) 6.02214076 × 10^23
B) 6.02214076 × 10^22
C) 6.02314076 × 10^23
D) 6.02114076 × 10^23

6. Marie Curie was awarded her second Nobel Prize in Chemistry in which year?

A) 1903
B) 1906
C) 1911
D) 1914

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7. What is the standard atmospheric pressure defined as in kilopascals (kPa)?

A) 98.5 kPa
B) 100.0 kPa
C) 101.325 kPa
D) 102.5 kPa

8. The 'C-14' isotope of carbon has a half-life of approximately how many years?

A) 5,730
B) 10,200
C) 12,500
D) 25,000

9. Which scientist is credited with the discovery of the element Polonium in 1898?

A) Antoine Lavoisier
B) Pierre and Marie Curie
C) Dmitri Mendeleev
D) John Dalton

10. At what temperature in Kelvin is absolute zero theoretically defined?

A) -273.15 K
B) 0 K
C) 273.15 K
D) 373.15 K

11. The first synthetic element to be named, Technetium, has an atomic number of what?

A) 42
B) 43
C) 44
D) 45

12. How many protons are contained in an atom of Uranium-238?

A) 92
B) 94
C) 146
D) 238

13. The 'Haber-Bosch' process for ammonia synthesis was developed primarily in which decade?

A) 1890s
B) 1900s
C) 1910s
D) 1920s

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14. What is the atomic mass unit (u) approximately equal to in kilograms?

A) 1.66 × 10^-27 kg
B) 1.66 × 10^-24 kg
C) 9.11 × 10^-31 kg
D) 1.67 × 10^-19 kg

15. In the IUPAC naming system, what is the prefix for a carbon chain of 8 atoms?

A) Hexa
B) Hepta
C) Octa
D) Nona

16. How many electrons can the d-subshell hold at maximum capacity?

A) 2
B) 6
C) 10
D) 14

17. Which element has the highest electronegativity value on the Pauling scale, set at 3.98?

A) Oxygen
B) Fluorine
C) Chlorine
D) Nitrogen

18. The Ideal Gas Law constant 'R' is approximately 8.314 with units of what?

A) J/(mol·K)
B) L·atm/(mol·K)
C) cal/(mol·K)
D) J/(mol·°C)

19. Arrhenius received the Nobel Prize in Chemistry in 1903 for his work on what?

A) Radioactivity
B) Electrolytic dissociation
C) Atomic structure
D) Quantum mechanics

20. How many sigma bonds are present in a single molecule of Ethyne (C2H2)?

A) 1
B) 2
C) 3
D) 4