

Historical Milestones in Organic Chemistry

Organic Chemistry · Answer Key · 17 Questions

1. Which of the following scientists is credited with the first synthesis of an organic compound from inorganic precursors, effectively challenging vitalism, by synthesizing urea in 1828?

- A) August Kekulé
- B) Dmitri Mendeleev
- C) Friedrich Wöhler**
- D) Jacobus Henricus van 't Hoff

2. The concept of the benzene ring's structure, a hexagonal planar arrangement of carbon atoms with delocalized electrons, was proposed by which chemist in 1865?

- A) Svante Arrhenius
- B) August Kekulé**
- C) Louis Pasteur
- D) Emil Fischer

3. Which pioneering chemist, in the late 19th century, laid the groundwork for stereochemistry by proposing that carbon atoms form tetrahedral structures and that optical isomerism arises from these spatial arrangements?

- A) Robert Boyle
- B) Jacobus Henricus van 't Hoff**
- C) John Dalton
- D) Amedeo Avogadro

4. The discovery of the functional group and its characteristic reactivity, a cornerstone of organic chemistry, is largely attributed to the work of which scientist in the mid-19th century?

- A) Justus von Liebig
- B) Antoine Lavoisier
- C) August Wilhelm von Hofmann**
- D) William Henry Perkin

5. What significant organic compound, the first synthetic dye, was discovered accidentally by William Henry Perkin in 1856 while attempting to synthesize quinine?

- A) Indigo
- B) Mauveine**
- C) Alizarin
- D) Phenolphthalein

6. The development of the theory of isomerism, where compounds with the same molecular formula have different structures, was significantly advanced by the work of which two chemists in the mid-19th century?

A) Berzelius and Wöhler

B) Liebig and Wöhler

C) Kekulé and van 't Hoff

D) Pasteur and Kekulé

7. Who is widely recognized for their extensive work on carbohydrates and purines, including the development of methods for their synthesis and analysis, earning them a Nobel Prize in Chemistry in 1902?

A) Otto Diels

B) Emil Fischer

C) Hermann Staudinger

D) Richard Willstätter

8. The first synthesis of an alkaloid, coniine, from simple inorganic and organic compounds was achieved by which chemist in 1885, further solidifying the synthetic capabilities of organic chemistry?

A) Alfred Nobel

B) Arthur Hantzsch

C) Albert Ladenburg

D) Fritz Haber

9. What crucial concept, describing the ability of carbon atoms to form long chains and rings, was championed by chemists like August Kekulé and Archibald Scott Couper in the 1850s?

A) Radical substitution

B) Catenation

C) Nucleophilic addition

D) Electrophilic aromatic substitution

10. The groundbreaking discovery of vulcanization, a process that improves the strength and durability of rubber by cross-linking polymer chains with sulfur, is attributed to which inventor in 1839?

A) Charles Goodyear

B) Thomas Edison

C) Alexander Graham Bell

D) Nikola Tesla

11. The Nobel Prize in Chemistry in 1912 was awarded to Victor Grignard for the discovery of his eponymous reagents, which are organometallic compounds crucial for forming new carbon-carbon bonds. What is the general formula of a Grignard reagent?

- A) R-Li
- B) R-MgX**
- C) R-B(OH)₂
- D) R-SnR'₃

12. Which chemist, in the early 20th century, pioneered research into polymerization and macromolecules, establishing that polymers are giant molecules rather than aggregates of small ones, and coining the term 'macromolecule'?

- A) Carl Bosch
- B) Fritz Haber
- C) Hermann Staudinger**
- D) Walther Bothe

13. The development of the Diels-Alder reaction, a powerful tool for synthesizing cyclic organic compounds, was first described by Otto Diels and Kurt Alder in what year?

- A) 1905
- B) 1928**
- C) 1950
- D) 1972

14. The concept of resonance in organic chemistry, explaining the delocalization of electrons in molecules like benzene and carboxylates, was a major contribution of which chemist in the 1930s?

- A) Linus Pauling
- B) Gilbert N. Lewis
- C) G. N. Lewis**
- D) Dorothy Hodgkin

15. Which organic compound, known for its pleasant aroma and use as a solvent, was one of the earliest organic compounds studied extensively and isolated from destructive distillation of wood by scientists like Carl Wilhelm Scheele?

- A) Ethanol
- B) Acetic Acid
- C) Methanol**
- D) Acetone

16. The seminal work on the structure and synthesis of complex organic molecules, including Vitamin C and the stereoselective synthesis of steroids, led to a Nobel Prize in Chemistry in 1950 for which scientist?

A) Robert Burns Woodward

B) Derek Barton

C) Gilbert Stork

D) E. J. Corey

17. The discovery of the carbon-carbon double bond and its reactivity in addition reactions was a foundational step in organic chemistry, notably advanced by the work of which scientist in the late 19th century?

A) Adolf von Baeyer

B) August Kekulé

C) Emil Fischer

D) Jacobus Henricus van 't Hoff