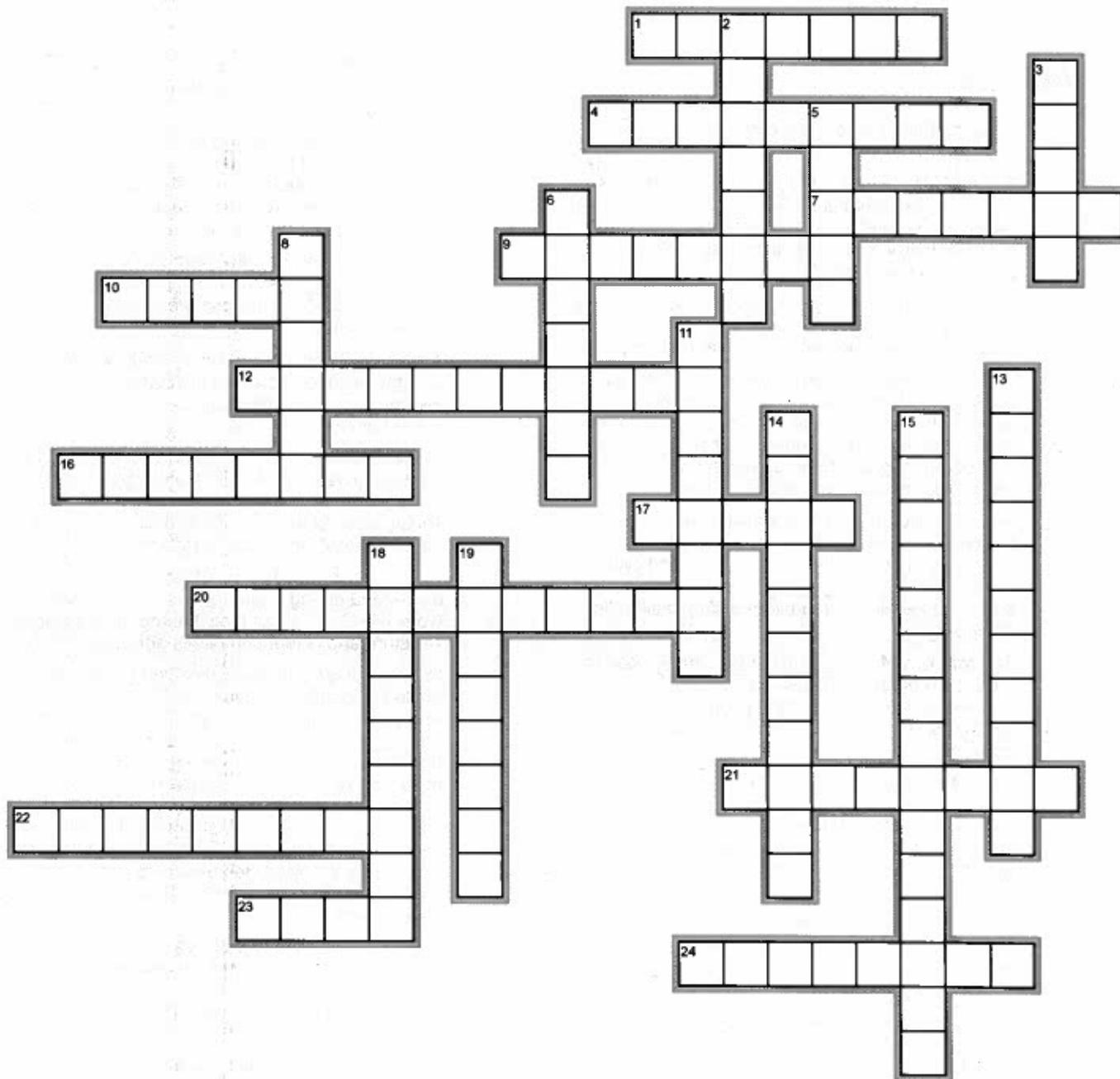


Nobel Prizes_1910_1919

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Across

1. The 1918 Nobel Laureate in Physics was awarded to Max Planck, but he actually received his prize one year later. His _____ theory was used by Albert Einstein to help describe the photoelectric effect and by Neils Bohr to understand the atom. These concepts play a key role in chemists' understanding of chemical reactions at atomic and molecular levels.
4. The Nobel Prize in _____ was not awarded in 1917.
7. The 1919 Nobel Prize in Chemistry was not _____.
9. Paul _____ was awarded the 1912 Nobel Prize in chemistry. His research was focused on hydrogenating carbon containing compounds using powdered metal species, including nickel.
10. The Planck constant, 6.626×10^{-34} _____-seconds, is used in the relationship in which the energy of electromagnetic radiation is

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- equal to Planck's constant times its frequency, shortened to the formula $E = hv$.
- The 1913 Nobel Prize recipient in Medicine was Charles Richet for his work on _____. _____ is a rapid, potentially life-threatening allergic reaction to something a patient is allergic to, such as peanuts or bee stings.
 - Theodore William _____ won the Nobel Prize in 1914 for his work measuring the exact atomic weights of many elements known at that time.
 - The Nobel Prize in chemistry was not awarded in 1916. The Nobel committee only considers external nominations and does not seek potential winners on their own. During this time, _____ War 1 was being fought in Europe, and overall, there were fewer nominations and awardees.
 - The 1910 Nobel Prize in chemistry was awarded for pioneering work with alicyclic compounds. An alicyclic compound has both aliphatic and cyclic components. _____ has three carbon atoms and is an excellent example of a simple alicyclic compound.
 - The reaction of _____ gas with nitrogen gas to produce ammonia is called the Haber-Bosch process. It was critical for the economical synthesis of ammonia for fertilizers and certain explosives.
 - The 1911 Nobel Prize was the second prize awarded to Madame Curie. In 1903 she was awarded the Nobel Prize in physics, which she shared with her husband. The discovery of radioactivity in 1896 by Henri _____ inspired the Curies.
 - Alfred Werner, who lived in Zurich, did most of his pioneering work with complexes that had a coordination number of _____.
 - The 1911 Nobel Prize in chemistry was awarded for the discovery of radium and _____. _____ was discovered in 1898 and is an alpha emitter. Alpha particles cannot penetrate a piece of paper.
 - The 1919 Nobel Prize in Physics was awarded to Johannes _____, in part for the splitting of spectral lines in an electric field.
 - The 1910 Nobel Prize was awarded to Otto _____. Early in his career he had an interest in terpenes, of which there are over 30,000 compounds that have been identified. They are typically isolated from plants.
 - The 1913 Nobel Prize in Chemistry was awarded to Alfred _____. Some of his pioneering work was focused on the discovery and explanation of optically-active isomers.
 - Theodore Richards' pioneering work with atomic weights provided data that indicated _____ of elements existed. The existence of neutrons was not yet proven.
 - Richard Martin _____ won the 1915 Nobel Prize for his innovative work with plant pigments. He was at Harvard University in Boston, Massachusetts. Today, when chlorophyll is used as a pigment it is called Natural Green 3 or E140.
 - _____ is the green pigment in plants used to make food during photosynthesis. There are six types of _____, but type A is the most common structure and is found in plants and algae.
 - In 1911, Alvar Gullstrand received the Nobel Prize in Medicine and Physiology for his research related to dioptics of the eye. To date, he is the only _____ to receive the Nobel Prize in physiology and medicine. His equations of refraction as they related to the human eye dramatically advanced ophthalmology as an interdisciplinary field. Gullstrand declined the Nobel Prize in Physics in 1911, but accepted the Physiology and Medicine the same year. He was a member of the Nobel Physics Committee for fifteen years.
 - The Stark effect, part of the 1919 Physics Prize, has been utilized by analytical chemists for the study of atomic spectra and _____ rotational spectra. Spectra is data based on electromagnetic radiation or light.
 - Victor _____ used magnesium metal as a reagent that helped smaller and simpler organic compounds to be combined and form larger species. His reagent is still widely used in chemistry.

Down

- Alfred Werner worked with complexes that had a platinum ion ($Pt(II)$) as the central atom, and used chloride ions and _____ molecules. Currently, there is a widely used cancer drug called cis-plat that has two chloride ions and two ammonia molecules linked to the central cation, platinum (II). Cis-plat has a square planar geometry.
- In 1918, the Nobel Prize in Chemistry was awarded to Fritz _____. He was born in Prussia, a region that now is part of Poland.