MARIE CURIE'S LIFE AND ACTIVITIES

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Annotation: *The article demonstrates the life of Marie Curie, her works in physics and chemistry, and her role in science. It also emphasizes the best creation of Marie Curie in physics with the example of radioactivity. Approaching the term "radioactivity" from the scientific point of view is highly supported in the article. This approach can help to understand how Marie Curie created radioactivity and her contribution in science.*

Key words: *pioneer, science, physicist, chemist, Nobel prize, radioactive, radium, polonium*

MERI KYURINING HAYOTI VA IJODI

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Annotatsiya: *Ushbu maqolada Meri Kyurining hayoti, fizika va kimyo yo'nalishida qilgan faoliyati va ilm-fandagi orni ko'rsatib beriladi. Radioaktivlik misolida fizikida eng yaxshi kashfiyot bo'lganini ta'kidlaydi. Maqolada "radioaktivlik" atamasiga ilmiy nuqtai nazardan yondashish yuqori darajada*

qo'llab-quvvatlanadi. Ushbu yondashuv Mari Kyuri radioaktivlikni qanday yaratganini va uning fanga qo'shgan hissasini tushunishga yordam beradi.

Kalit so'zlar: *pioner, ilm-fan, fizik, kimyogar, Nobel mukofoti, radioaktivlik, radiy elementi, poloniy moddasi*

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Аннотация: *В статье показана жизнь Марии Кюри, ее работы по физике и химии, ее роль в науке. Также подчеркнуты лучшие творения Марии Кюри в физике на примере радиоактивности. В статье поддерживается подход к термину «радиоактивность» с научной точки зрения. Этот подход может помочь понять, как Мария Кюри создала радиоактивность и ее вклад в науку.*

Ключевые слова: *пионер, наука, физик, химик, Нобелевская премия, радиоактивность, радий, полоний.*

INTRODUCTION

People answer without hesitation “Marie Curie” when someone asks about well known woman scientist. The reasons seem clear. Marie Curie was the first woman scientist who made crucial theoretical breakthroughs in the field of science in the twentieth century when she postulated that radiation was an atomic rather than a chemical property. She was the first person to create and use the term radioactivity. Her studies motivated a long search that culminated in the isolation of two new elements, polonium and radium. Marie Curie was born Maria Sklodowska on November 7, 1867, in Warsaw, Poland, then under Russian control. She was interested in learning new things and an intelligent girl, from her younger age. After graduating high school, Curie went to Paris to continue her

study at the Sorbonne (now the University of Paris), where she earned degrees in physics and mathematics. It was in Paris that she adopted the French version of her name, Marie. In 1894, while she was studying at the Sorbonne, she met Pierre Curie, a physicist and professor at the University of Paris. After that, they became close collaborators as friends, however in recent days their professional friendship turned relationship. They married on July 26, 1895. Pierre was supportive of Marie's scientific ambitions, and together, they would go on to make unforgettable history in science life. Marie Curie's legacy lives on not only in her scientific discoveries but also in her role as a trailblazer for women in science. She was the first woman who won a Nobel Prize twice in the field of physics and different scientific disciplines, became the first woman professor at the University of Paris. Her life and work continue to inspire generations of scientists, especially women in the sciences, and her contributions to chemistry, physics, and medicine are immeasurable.

ANALYSIS HER WORKS AND RESULTS

Marie Curie, one of the most renowned scientists in history, is best known for her groundbreaking research on radioactivity, a term she coined herself. Her pioneering work not only revolutionized our understanding of atomic physics but also earned her two Nobel Prizes, making her the first person to win Nobel Prizes in two different scientific fields. This article traces her remarkable contributions to science and the challenges she overcame along the way. In the late 19th century, scientists were increasingly intrigued by the phenomenon of radioactivity, but it was not fully understood. The discovery of X-rays by Wilhelm Roentgen in 1895 had raised questions about the nature of radiation, and Henri Becquerel's discovery of spontaneous radiation in uranium salts in 1896 further spurred curiosity. However, no one could explain the source of this radiation.

Marie Curie, driven by a passion for discovery, began her own investigations into this mysterious phenomenon. She focused on the mineral pitchblende (now known as uraninite), which was known to be highly radioactive. Through meticulous experimentation, Marie and Pierre Curie observed that pitchblende was more radioactive than uranium alone could explain. This led Marie to hypothesize that the mineral contained a previously unknown element that was emitting radiation.

In 1898, after months of intensive research, the Curies discovered two new elements: polonium, named after Marie's native Poland, and radium. Both elements exhibited intense radioactivity, and their properties challenged existing theories about atomic structure and energy. Marie Curie's work was pivotal in uncovering the nature of radioactive decay and transforming our understanding of matter at a subatomic level.

Marie Curie is credited with coining the term “radioactivity” to describe the emission of radiation by certain elements. Her work provided the foundation for later discoveries in nuclear physics and chemistry. She demonstrated that radioactive elements emitted rays without the need for external stimuli, a phenomenon that was completely new and contrary to previously established scientific ideas. Marie and Pierre Curie’s research laid the groundwork for future studies in both chemistry and physics. While Pierre’s death in 1906 was a devastating blow to Marie, she continued their work and made groundbreaking strides on her own. Marie Curie’s pioneering work in radioactivity did not go unnoticed. In 1903, she, Pierre Curie, and Henri Becquerel were jointly awarded the Nobel Prize in Physics for their contributions to the study of radiation. The Nobel committee specifically recognized their work in uncovering the mysteries of radioactivity, a field that had only recently emerged. This award made Marie Curie the first woman to receive a Nobel Prize. However, this honor came at a personal cost.Marie’s achievement was often overshadowed by the accomplishments of her male colleagues, particularly Pierre, and her own contributions were sometimes minimized in public and academic circles. Yet, Marie remained steadfast in her dedication to science and research, even as she faced significant challenges as a woman in a male-dominated field.

1906 was very difficult for Marie, because she lost her husband in this year in street accident. This event was real tragedy for her. Marie was left to carry on their research alone, a daunting prospect for any scientist, but especially so for a widow in a time when women’s contributions were often overlooked. Despite this, Marie continued her work on radium and polonium and further advanced her studies into the medical applications of radiation. Marie Curie’s work on radium and polonium continued to yield remarkable results. In 1911, she was awarded her second Nobel Prize, this time in Chemistry, for her discovery of radium and polonium and her investigation of their properties. She became the first person ever to win two Nobel Prizes in different fields, a rare distinction that cemented her place as one of the most important scientists in history. Her research on radium, in particular, had a profound impact on medicine. Radium was soon used in cancer treatments, and her discovery of its radioactive properties led to the development of radiology as a medical specialty. Marie Curie’s research contributed to the birth of nuclear medicine and set the stage for innovations in medical imaging, cancer therapy, and radiation protection.

In the years following her second Nobel Prize, Marie Curie continued her work at the Radium Institute, which she founded in Paris. She faced increasing health problems due to her long-term exposure to radiation, a danger that was not

fully understood at the time. Curie's health declined over the years, and she died on July 4, 1934, from aplastic anemia, a condition linked to radiation exposure.

CONCLUSION AND RECOMMADATION

Marie Curie's discovery of radioactivity was one of the most transformative achievements in the history of science. Her groundbreaking research on radium and polonium changed the way we understand atomic structure, energy, and the potential applications of radiation. Through her unwavering dedication, despite personal loss and societal challenges, she not only earned two Nobel Prizes but also paved the way for future generations of scientists. Marie Curie remains a symbol of intellectual brilliance, resilience, and the pursuit of knowledge, leaving an indelible mark on the scientific community.

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