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Name and symbol of the element with atomic number 112 (IUPAC Recommendations 2010)*

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Abstract: A joint IUPAC/IUPAP Working Party (JWP) has confirmed the discovery of the element with atomic number 112. In accord with IUPAC procedures, the discoverers proposed a name, copernicium, and symbol, Cn, for the element. The IUPAC Inorganic Chemistry Division Committee recommended this proposal for acceptance, and it has now been approved by the IUPAC Bureau as delegated to act by the IUPAC Council meeting on 12 August 2007.

Keywords: Cn; copernicium; element 112; element name; IUPAC Inorganic Chemistry Division; periodic table.

INTRODUCTION

In 2005 a joint working party (JWP) of independent experts drawn from the International Union of Pure and Applied Chemistry (IUPAC) and the International Union of Pure and Applied Physics (IUPAP) was appointed by the Presidents of the Unions to determine priority of claims to the discovery of elements with atomic numbers greater than 111. This JWP considered literature and documentation submitted to it by 30 June 2007. Its consideration of these data was carried out in accordance with the criteria for the discovery of elements previously established by the 1992 IUPAC/IUPAP Transfermium Working Group [1–3] and reinforced in subsequent IUPAC/IUPAP JWP discussions. The group decided to report first [4] on the discovery of element with atomic number 112. Prior to its publication, this report was sent to each of the claimant laboratories to be checked for technical accuracy. It was also reviewed by the requisite number of independent expert referees, and its findings were accepted by the Executive Committees of the two Unions and by the Division Committee of the IUPAC Inorganic Chemistry Division. The JWP will issue its second report, dealing with claims for the discovery of elements with atomic numbers in the range 113–118, in the near future.

RECOMMENDATION

The 2009 JWP report [4] accepted the combination of the 1996 [5] and 2002 [6] claims by the Hofmann et al. research collaborations at Gesellschaft für Schwerionenforschung (GSI) as the first evidence for the synthesis of element with atomic number 112, being supported by subsequent measurements of Morita et al. [7,8] and by assignment of decay properties of likely hassium intermediates [9–11] in the

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decay chain originating from $^{277}112$. Following the assignment and in accordance with the procedures established by IUPAC for the naming of elements [12] the discoverers at the GSI in Darmstadt, Germany were invited to propose a name and symbol for the element with atomic number 112. The discoverers proposed the name copernicium and the symbol Cn.

This proposal lies within the long tradition of naming elements to honor famous men and women of science. Nicolaus Copernicus was born on 19 February 1473, in Torún, Poland and died on 24 May 1543, in Frombork/Frauenburg, also in Poland. His work has been of exceptional influence on the philosophical and political thinking of mankind and on the rise of modern science based on experimental results. During his time as a canon of the Cathedral in Frauenburg, Copernicus spent many years developing a conclusive model for complex astronomical observations of the movements of the sun, moon, planets, and stars. His work published as "De revolutionibus orbium coelestium, liber sixtus" in 1543 had very far reaching consequences. Indeed, the Copernican model demanded major changes in the view of the world related to astronomy and physical forces as well as having theological and political consequences. The planetary system introduced by Copernicus has been applied to other analogous systems in which objects move under the influence of a force directed toward a common center. Notably, on a microscopic scale this is the Bohr model of the atom with its nucleus and orbiting electrons. The Inorganic Chemistry Division Committee has considered the proposal of the discoverers and recommends to the IUPAC Bureau and Council that the name copernicium and the symbol Cn for the element with atomic number 112 be accepted. This recommendation has now been approved by the IUPAC Bureau as authorized by the IUPAC Council meeting in Torino in August 2007.

Note: We note that an initial proposal by the discoverers that Cp be the symbol for copernicium was found not to be acceptable principally because this symbol had earlier been used for element with atomic number 71 (lutetium) which, prior to 1949, had cassiopeium as an alternative allowed name—see ref. [12].

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