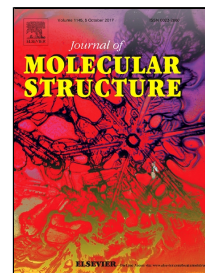


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# Synthesis and Anti-lung Cancer Activity of a Novel Arsenomolybdate Compound

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## Abstract

The new compound based on Wells-Dawson-type arsenomolybdate:  $[\{\text{Cu}_{10}(\text{pz})_{11}\text{Cl}_4\}\{\text{As}_2^{\text{III}}\text{As}_2^{\text{V}}\text{Mo}_6^{\text{V}}\text{Mo}_{12}^{\text{VI}}\text{O}_{62}\}]\cdot\text{H}_2\text{O}$  (**1**) has been hydrothermally synthesized and characterized by single-crystal X-ray diffraction analysis, X-ray powder diffraction (XRPD), XPS spectroscopy and thermogravimetric analysis (TG). Compound **1** is consisted of two As caps Wells-dawson-type arsenomolybdate and  $\{\text{Cu}_{10}(\text{py})_{11}\}$  complexes by chloride bridge. In addition, the antitumor effects of the title compound **1** were studied on three human lung cancer cells (A549, SK-LU-1 and SW1573). The results showed that compared with the positive reference drug carboplatin, compound **1** displayed efficient antitumor activity.

**Key words:** Arsenomolybdate, X-ray, Antitumor

## 1. Introduction

Cancer can be defined as a disease in which cells grow out of control and spread to surrounding normal tissues [1, 2]. Cancer can be classified as malignant tumors, able to spread by invasion and metastasis. There are numerous known cancers in humans and their occurrence can be attributed to genetic or environmental factors, including chemicals, diet, physical inactivity, infection, radiation, and hormones [3, 4]. Although there is a large amount of information available dealing with clinical aspects of cancer chemotherapy, we felt that there was a clear need for an updated treatment from the point of view of medicinal chemistry and drug design [5, 6].

The design and synthesis of the coordination polymers and supramolecules with transition metal have caused much attention in the past few years [7, 8]. The aims of the research of this field are the discovery and synthesis of new complexes and materials with practical function and application value, for example, transition metal coordination complexes have been applied in the field of light, electricity, magnetism, new materials, catalyst, bionics, and biology [9, 10]. Polyoxometalates (POMs), known as an outstanding class of molecules with unmatched structural variety and versatility, have attracted long-lasting research interest in catalysis, photochemistry, electrochemistry, magnetism, biochemistry and pharmaceutical chemistry [11, 12]. In this work, a novel arsenomolybdate compound  $[\{\text{Cu}_{10}(\text{pz})_{11}\text{Cl}_4\}\{\text{As}_2^{\text{III}}\text{As}_2^{\text{V}}\text{Mo}_6^{\text{V}}\text{Mo}_{12}^{\text{VI}}\text{O}_{62}\}]\cdot\text{H}_2\text{O}$  (**1**) was hydrothermally prepared and its antitumor activities were then evaluated.

## 2. Experimental

### 2.1 Apparatus and materials

All the starting materials and reagents used in this work were obtained commercially and used without further purification. Element analyses (C, H and N) were determined with an elemental Vairo EL III analyzer. **The**

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