



The diamond and diamond lovers

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Abstract

This paper provides a comprehensive knowledge of all aspects of a diamond as follows. First gives a brief introduction of how diamond jewelry can do for us. By examining on its chemical composition, cubic crystal structures, and creation conditions of natural diamonds; the extreme properties are pointed out in section 2. The precious gemstone productions are fully described in great details in section 3 and the final products are evaluated and classified by the international bodies in section 4. Section 5 is dedicated to Synthetic Diamonds. A few tips helping diamond lovers not to be ripped off are carefully discussed and pointed out in section 6. Last but not least, the aims at advanced cutting diamonds are investigated with the help of sophisticated tools; the aided values of the diamonds are presented in section 7. Finally, the personalized conclusion says it all.

Key words: *Carat, Gemstone, Covalent, Ionic, Metallic bonds*

1. Introduction

The Diamond and its flawless shinning flare have probably done more to shape our life than any other things existed in this planet. It has given women fidelity and love, made men looking rich and high class, opened up new lives, and offered us novel feeling. While in the technological world, scientists have found diamond very impressive because of its wide range of extreme properties, which are nothing but the best. In this paper, we will walk through all aspects of diamonds and explain as much as we can its beauty as well as its super characteristics that make diamond so unique.

2. Natural diamonds

2. 1. Chemical composition

As we all know, the earth is a solid part of the universe, consisting of minerals. Diamonds pulled out of the earth are also minerals, which are naturally occurring substances that are inorganic, solid and have a specific chemical composition and an ordered atomic arrangement. In the first glance, this mineral is very much like Quartz for its shinning flare. However, Quartz is silicon dioxide (SiO_2), which means one atom of silicon for every two atoms of oxygen. In addition, the bond between silicon and oxygen ($\text{Si} = \text{O}$) is neither purely ionic nor purely covalent bonds. However, this is really an intermediate bond in character, because each oxygen atom has two free electrons in its outer shell, which are ready to give to Silicon atom, in forming the Silicon outer shell with a complete eight electron orbital. Such an intermediate bond is typically called Polar Covalent Bond, in which the electron pair