Conversion of Coconut Shell tobe Graphite and Graphene Nano Sheets Switching, Is It Possible?

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ABSTRACT

We deeply observed howto produce graphite and graphene nano sheets base on renewable natural resources. The aims of this research are to produce graphite and graphene nano sheets switching on low temperature and versatile method and also to probe hypothesis about the soul atom. In this research, we used coconut as a raw material. First, coconuts were put on alumina (Al) and glass vessel, respectively. Then, both of them were cracked by using oven (T = 200 °C). After that, they were pyrolized on 600 °C to generate charcoal. Finally, each of charcoal was analyzed by using X-ray diffraction (XRD). The results show while the coconut embedded on its shadow (cracking process used Al vessel) will generate graphite (C-sp^3). It was probed that the sharp peak appeared at 2θ (27.8640 Å), indicating the graphite was formed. On the other hand, while the distance of coconut position was far from its shadow (cracking process used glass vessel), interestingly Graphene Nano Sheets Switching (C-sp^2) was generated. It was clarified by the weak and broad peak at 2θ (23.6400). We concluded that vessel as cracking process and shadow position between material and its shadow (soulness) may affect properties of physical material of carbon.

Keywords: *Soul atom, Graphite, Graphene nanosheets switching, Soul atom model, Lewis base.*

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1. INTRODUCTION

Graphene is a miracle material due to it has many superior properties. Production for a graphene application is a pivotal thing. This is caused production of graphene need strict requirements those are lowest grade, large scale, cheapest, sustainable and simple method [1]. The majority method to produce graphene used graphite [2, 3] and SiC [4-6] as raw materials. Recently, there are several methods to produce large scale grapheneaplication, namely i) mechanical [7] ii) exfoliation of materials [8] iii) Chemical Vapour Deposition (CVD) [9, 10] and iv) modification of graphene and producing of graphene sheets by using chemical [11-17]. Almost of large scale graphene production base on graphite as well as raw material.

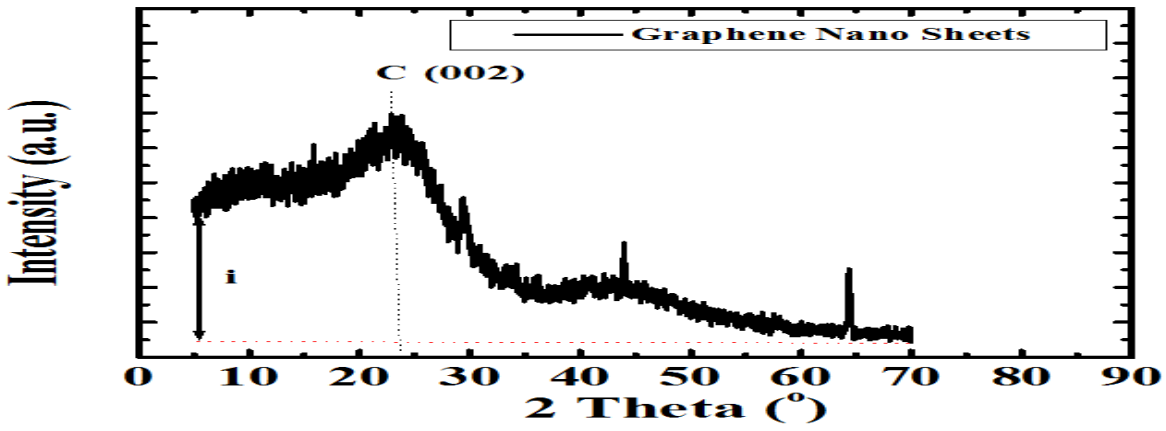
Human beings are well known that worldwide graphite was produced by mining process. Unfortunately, graphite can not produce by laboratory. It is only be produced from nature and unrenewable resources. Our idea, we used coconut. That is due to coconut is abundant resources and C-amorphous. The challenging is how to convert C-amorphous to be C-crystalin. Therefore, we prepared experimental base on coconut shell as a raw material. Interestingly, on the cracking step, we observed that the shadow position of coconut was embeded on its vesel while we used Al as its vesel. On the other side, the difference thing occured while we used pyrex glass as a vesel of coconut, its shadow was far away from coconut. We found if coconut position embeded on its shadow, resulting grahite, but if coconut position was far from its shadow, resulting Graphene Nano Sheets Switching. We concluded that the position of shadow embeded on coconut expressed about the truth hypothesis of atom soul.

1.1. Experimental

We prepared two charcoals those are i) Coconut was put on Al vesel. Then, it was heated on 200°C for 10 minutes by using oven, resulting the cracking coconut shell. After that, we separated between fruit and coconut shell. Coconut shell was pyrolized on 600°C, and the product was characterized by using XRD and ii) Coconut was put on pyrex glass vesel. Then, it was heated on 200°C for 10 minutes, resulting the cracking coconut. After that, we separated between fruit and coconut shell. Coconut shell was pyrolized on 600°C, and the product was characterized by using XRD.

2. RESULTS AND DISCUSSION

The XRD data of Graphene Nano Sheets Switching is shown in Figure 1.



i = switching phenomenon

Figure-1. XRD pattern of Graphene Nano Sheets Switching

Source: Resarch Data, Shimadzu XRD

The intensity of Graphene Nano Sheets Switching is much more far from zero number compare than charcoal. That is due to the shadow effect and material will be switching. In the case of Graphene Nano Sheets Switching, the position of coconut was far distance from its shadow during the heating process on coconut until the coconut was cracked. On the other hand, the formation of graphitr (Figure 2) was occurring due to coconut position was embedded on its shadow during the cracking process by using fire from stove.

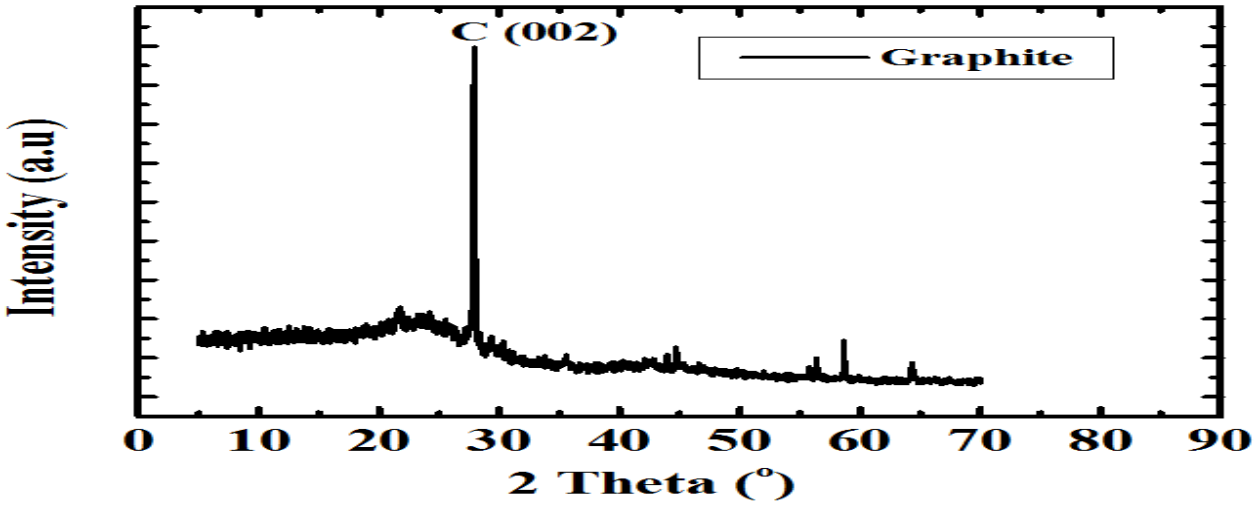


Figure-2. XRD pattern of Graphite

Source: Resarch Data Shimadzu XRD

Figure-1. and 2 explain that soul atom relate to its shadow. That is explained by our hypoyhesis about soul atom (Figure 3).

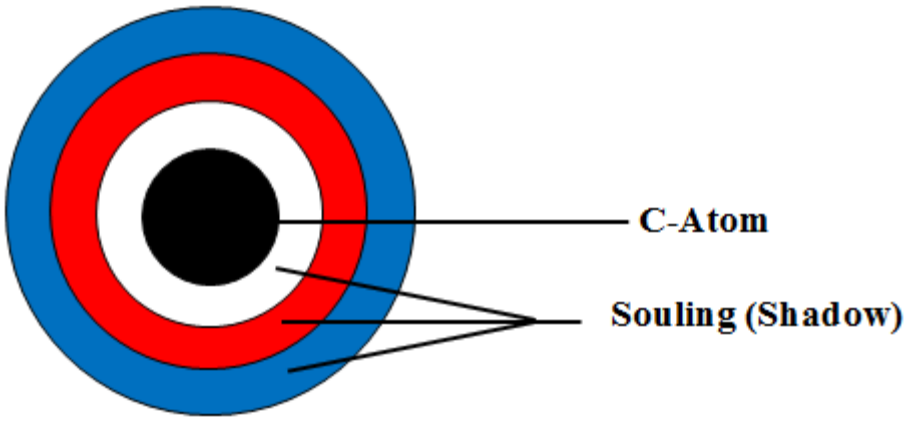


Figure-3. Hypothesis of Soul Atom

Source: Authors's hypothesis base on experiment

Figure 3 shows that atom has shadow. While shadow embeded on atom will result the sharp peak, indicating C-crystalin. But, while atom and shadow is far away each other, it will result C-amorphous. This phenomenon, we call soul atom. We may express this phenomenon by gradually step.

i) Aluminum (Al)-Vessel Effect

Step-1: First, coconut shell was put on Al-vessel for cracking process. We suppose that Al as a base Lewis will donate its electron into coconut shell during the cracking process. It may affect the coconut shell will be cracking due to entropy effect. Finally, it was continue with pyrolized on 600 ^{o}C. During, pyrolisation process, the high

temperature will contribute to supply many electrons into carbon of coconut shell. It supposes to generate the large and narrow of carbon atoms and graphite is formed.

ii) Glass-Vessel Effect

Step-1: First, coconut shell was put on glass-vessel for cracking process. Glass as an inert material will relatively slow to donate electron into coconut shell during the cracking process. It may affect the coconut shell will be cracking due to entropy effect for a much more time than Al-vessel. Finally, it was continue with pyrolized on 600 ^{o}C. During, pyrolisation process, the high temperature will contribute to supply not so many electrons into carbon of coconut shell. It supposes to generate the small and broad of carbon atoms and graphene nano sheets is formed.

3. CONCLUSION

Each of atom has soul (shadow). The shadow phenomenon relates to the C-physical properties.We also succed to produce graphite from coconut by using versatile method and large scale product.The vessel for cracking process may affect the kind and properties of carbon.

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