Decomposition of Amygdalin under High Pressure Using X-ray Induced

Chemistry

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Abstract

Studies of Amygdalin are becoming more common every year due to the fact that many individuals in both physics and medical realms believe that it could be a possible method for treating cancer cells. The purpose of my research is to show that Amygdalin, a glycoside found in most fruit seeds, when irradiated under the right varied high pressure and ambient temperatures, will fully decompose and produce Hydrogen Cyanide (HCN), among sugar and Benzaldehyde. By irradiating samples of Amygdalin under high pressure using White x-rays (within 8kV to 60 kV) in a Diamond Anvil Cell (DAC) I intend to observe the decomposition of Amygdalin.

Introduction

X-ray induced chemistry is a relatively new method of creating chemical reactions in compounds. My work is an extension of recent research using x-ray induced chemistry in producing H, from NH, BH, and O, from KCLO, using this same method. Traditionally, in order to induce a chemical reaction some form of heat or energy must be applied to the compound. We irradiated samples of Amygdalin using two different sources. One source of energy in this experiment was provided by a third generation synchrotron which emitted hard x-rays (less than 15KeV) to decompose Amygdalin in a diamond anvil cell (DAC) under high pressure. The second was by a Nividium YAG laser that irradiated samples of Amygdalin on glass slides at a frequency of 355nm.

Hypothesis

The decomposition products of Amygdalin are glucose, benzaldehyde, and hydrogen cyanide.

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I hypothesize that by using x-ray induced chemistry, we can fully decompose Amygdalin and produce Hydrogen Cyanide (HCN). The production of HCN from Amygdalin will be the first steps to creating a possible new method for treating cancer cells. If successful, medical studies of cancer cells injected with Amygdalin can begin with the hopes that after absorption, cells with be bombarded directly with x-rays causing decomposition of Amygdalin and thus releasing HCN, destroying the cells from the inside.

References Acknowledgements

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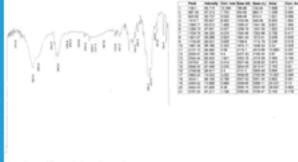
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Method and Results

1.Sample of Amygdalin (C, H, NO,) is loaded onto glass slide.

2. Sample is bombarded with rays at 355nm for intervals of 15 minutes for 1 hr until sample is scorched in several

3. Infrared spectroscopy is performed on sample to confirm if full decomposition is accomplished.



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*500 - 1500 wave numbers: Benzene Ring can be seen *2000 - 2500 wave numbers: Glucose can be seen ason wave numbers: Peaks indicate that sample formed OH, alcoholic bond and was not completely

Unfortunately, HCN was not detected in the IR analysis. Further experiments must be done to achieve expected results.