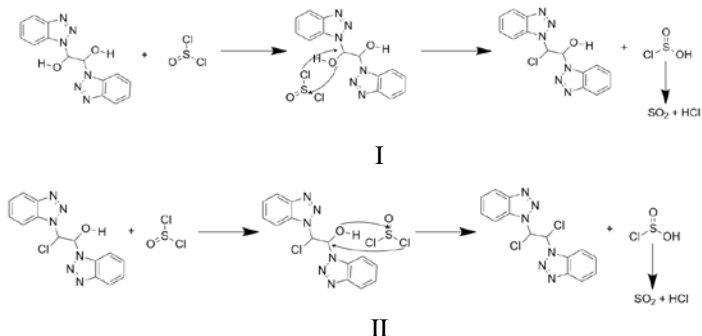


Образование II происходит как реакция нуклеофильного замещения при насыщенном атоме углерода алкильного фрагмента в I.



Таким образом, полученные соединения являются производными 1*H*-изомеров бензотриазола.

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3D PRINTING OF AEROSPACE PARTS OF THE STUDENT ASSOCIATION ROCKETLAV

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Key words: 3D printing, association, aerospace, FDM

3D printing process builds a three-dimensional object from a computer-aided design model, usually by successively adding material layer by layer that is why it is called additive manufacturing. Additive manufacturing involves construction of objects by adding necessary material, rather than removing excess material, as in the case of subtractive methods.

Since late 1970s, several methods of 3D printing have appeared. The first printers were large, expensive and they had very limited capabilities. At present, a wide range of additive manufacturing methods is available. Main differences are in the method of layering and materials used. Some methods are based on fusion or softening of materials to create layers, such as selective laser sintering (SLS), selective laser melting (SLM), direct laser sintering of metals (DLS), fused deposition method (FDM), stereolithography (SLA) etc.

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Selective laser melting (SLM) is the most commonly used to print some parts of aircraft or rockets, such as combustion chambers, fuel nozzles, fittings, some parts of wings, parts for rocket engines, etc. SLM has some advantages: almost no limitations in geometry, using many different metals and optimization of production costs due to minimal waste. Nevertheless, this method of printing is rather expensive for individual aerospace enthusiasts. There is more cheap method of printing - fused deposition method (FDM). This method allows aerospace enthusiasts to make some parts for their projects.

In Samara University there is a student's aerospace engineering association RocketLAV. RocketLAV is the association of students engaged in designing and building experimental models of rockets with support of Samara University. The main goal of this association is to gain design experience and create launch vehicles at the international competition «C'Space» and the «Air-Engineering School» championship. RocketLAV has several projects that include some 3D-printed parts: two-stage rocket «Kraken» and one-stage rocket «Capella» that are currently being developed.

The material to print (filament) is PETG. It is extremely strong material and smell-free when printing. PETG plastic produces excellent support structures because it adheres well. As a result, the adhesion between the layers is rather strong, so it is durable. This plastic is chemically resistant, it does not suffer from alkalis, acids and water.

3D printing technology allows to accelerate prototyping of products of rocket and space technics that leads to more accelerated manufacture of a product with the minimum resource losses and expenses. This helps reduce economic and time costs during project development or testing of various systems or subsystems.

УДК 347.191.1

РЕШЕНИЯ СОБРАНИЙ В СИСТЕМЕ ЮРИДИЧЕСКИХ ФАКТОВ

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Ключевые слова: решение собрания, гражданско-правовое сообщество, орган юридического лица

Решения собраний, в его современной интерпретации законодателем и судебными инстанциями, – это «решения гражданско-правового сообщества, т.е. определенной группы лиц, наделенной

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