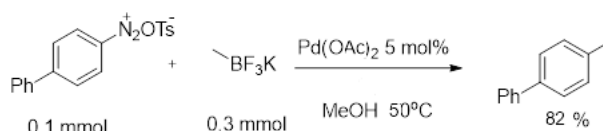


tosylate can be carried out with the yield of target methyl biphenyl up to 82%.

The research showed the possibility of catalytic arylation of alkanes and also showed the possibility of C_{sp3}-C_{sp2} bonds formation. We once again proved the practical importance of arenediazonium tosylates in organic synthesis.



Scheme 3.

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NEW SYNTHESIS OF IMINODIACETATE LIGANDS

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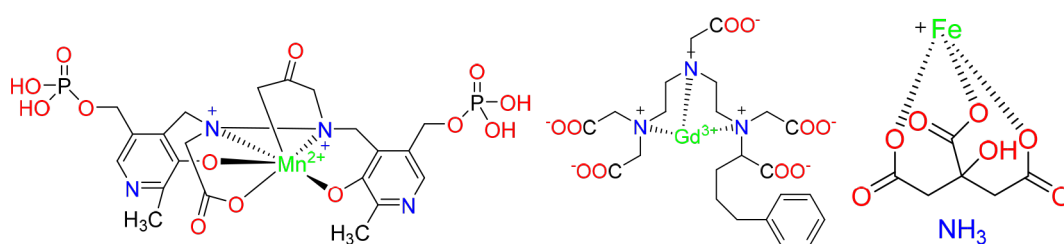
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Timely diagnosis is one of the most important ways to maintain human health. Because it's easier to prevent diseases, than cure it. One of the most informative types of diagnosis is magnetic resonance imaging (MRI). It allows specialists to accurately examine the internal organs and systems of the human body. Contrast agents are used to improve the visualization of diseases and areas affected. With their help specialists can not only to determine the location of the neoplasm, but also its size and structure. As such agents, substances based on ions

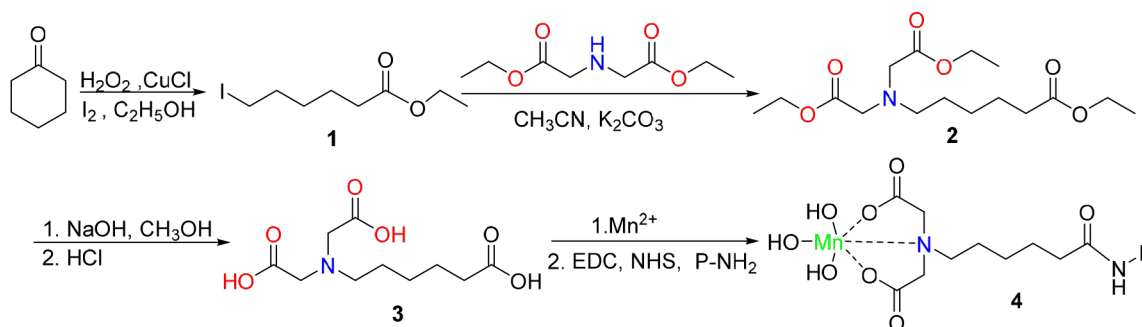
of gadolinium, manganese, iron, chromium, etc. (Scheme 1).

For a long time, gadolinium-based compounds were the most popular among contrast agents. But these agents are very toxic and cause fibroses. Consequently, specialists are looking for safer alternatives.

To reduce their toxicity, they are introduced into the complex, as a rule, with such ligands, as diethylenetriaminepentaacetic acid (DTPA), ethylene diamine tetraacetic acid (EDTA), or with their de-



Scheme 1. Different contrast agents



Scheme 2. General synthesis scheme

rivatives [2].

We chose as ligand iminodiacetic acid (IDA) (figure 2) [3]. The initial substrate was ethyl 6-iodohexanoate [4]. It was obtained by the oxidative cleavage of cyclohexanone in the presence of iodine, hydrogen peroxide and copper chloride. Then from it was obtained the product 2 the presence of dimethyliminodiacetate (it was previously synthesized from iminodiacetic acid), potassium carbonate with heating. The product was purified with silica gel column chromatography with a yield of 70%.

We found that in this case, alkaline hydrolysis

is more preferable than acidic (since acidic hydrolysis is a reversible process). Thus, the hydrolysis is carried out in methanol in the presence of sodium hydroxide with heating. The product (3) is obtained with high yields of 80% and not requiring additional purification.

So, we offer a simple and effective method to obtain IDA iminodiacetic acid derivatives based on readily available and non-toxic substrates – cyclic ketones. The resulting 6-bis (carboxyethyl) amino-hexanoic acid (3) is planned to be used as a contrast agent for MRI, as shown in Scheme 2.

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MATHEMATICAL MODELING APPLICATION FOR STUDYING AND OPTIMIZATION OF SYNTHETIC DETERGENTS PRODUCTION

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Highly viscous component is a by-product of sulfonation process. It accumulates in tubes of reactor and leads to non-uniformity of organic film flow, which leads to deterioration of product quality. When the concentration of a highly viscous component reaches a critical value the reactor is washed by water. This process eliminates the highly viscous

component.

The purpose of this work is simulation of the sulfonation of linear alkylbenzene which takes place in the multi-tubular film reactor to study the duration of periods between reactor washings.

There are 4 periods between reactor washings selected for the research (Fig. 1). The necessity

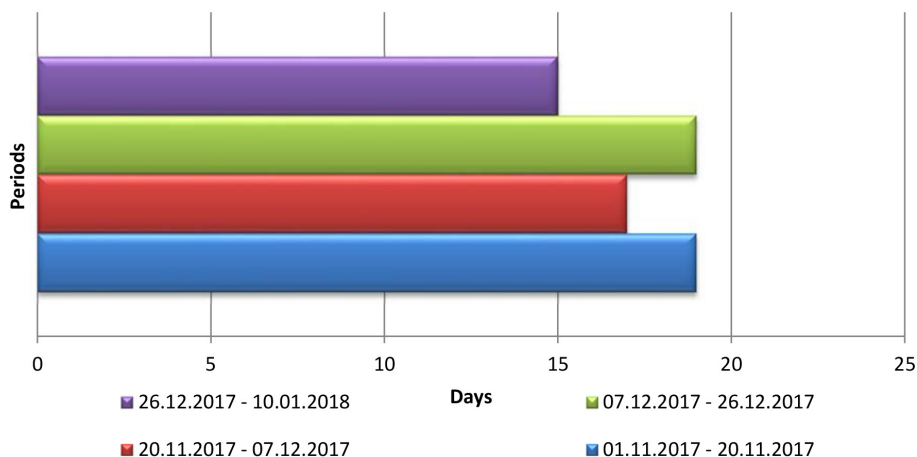


Fig. 1. Experimental data on periods between reactor washings