

# Synthesis of two new discotic liquid crystals with 1,3,4-oxadiazole as functional group

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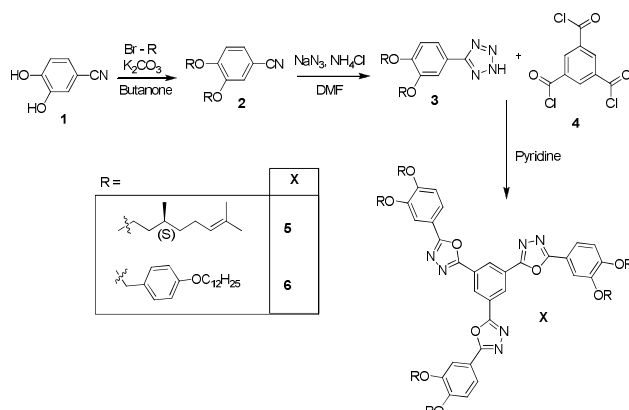
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## INTRODUCTION

Since the first record of discotic liquid crystals (DLCs) by Chandrasekhar *et al.* in 1977<sup>1</sup>, the synthesis and studies of these materials have been increased exponentially. They present remarkable charge transport properties including electronic conductivity<sup>2</sup>, and thus several devices have been built based on these electrooptical properties, such as solar cells, active components for image and data treatment, among others<sup>3</sup>. Considering the properties above mentioned, two new molecules were synthesized (**5** and **6**), which exhibit properties characteristics of liquid crystalline mesogenic with discotic anisotropy.

## RESULTS AND DISCUSSION

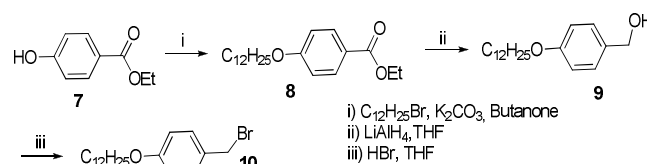
The synthetic route of targets compounds (DLCs) was carried out as described on Scheme 1.



**Scheme 1.** Synthesis of 1,3,4-oxadiazole derivatives.

The synthetic route for the preparation of compounds **5** and **6** was same for both, changing only the R group. Initially the 3,4-dihydroxybenzonitrile was alkylated with appropriated R group to produce compound **2**, which reacted with sodium azide and ammonium chloride in dry DMF to form tetrazole **3**. The compound **3** was reacted with triacid chloride **4** (previously prepared

from 1,3,5-benzenetricarboxylic acid in thionyl chloride), in pyridine, forming the desired compounds **5** and **6**. The synthesis of alkoxybenzylbromide **10**, is presented on Scheme 2. The hydroxy group in compound **7** was alkylated, and the corresponding ester group was reduced using LiAlH<sub>4</sub> in THF to give **9**, which reacted with HBr to form the bromide **10**.



**Scheme 2.** Synthesis of substituent R (10) of compound **6**.

All compounds were characterized by <sup>1</sup>H and <sup>13</sup>C NMR spectroscopy. These final compounds **5** and **6** showed liquid crystalline properties. Compound **5** was characterized by polarized light optical microscopy (POM) and differential scanning calorimetry (DSC). This compound is liquid crystal at room temperature, presenting isotropic phase at 121 °C, and exhibiting columnar mesophase characteristics of DLC's. The analysis of mesophases of compound **6** are under investigation.

## CONCLUSION

Two new compounds, **5** and **6**, 1,3,4-oxadiazole derivatives, with liquid crystalline properties were synthesized and both showed luminescent properties.

## ACKNOWLEDGEMENTS

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## REFERENCES

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