

## SYNTHESIS OF RUBAZONIC ACID DERIVATIVES AND THEIR POLYMERS

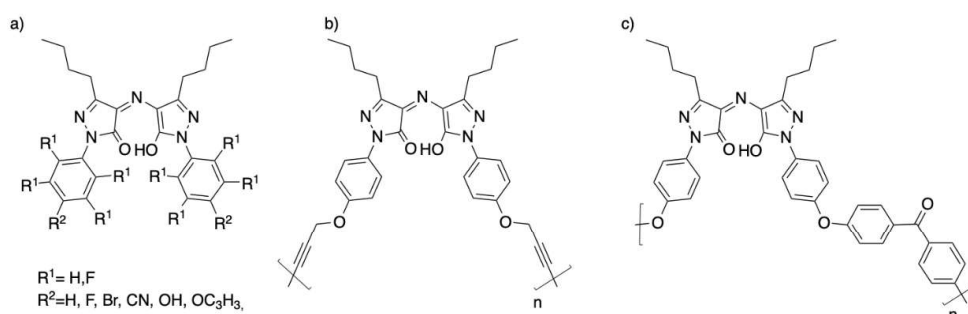
Anastasiia Krupka <sup>1</sup>, Beata Derkowska-Zielinska <sup>2</sup>, Stefan F. Kirsch <sup>1,\*</sup>

<sup>1</sup> School of Mathematics and Natural Sciences, Organic Chemistry, University of Wuppertal, 42119, Gaußstr. 20, Wuppertal, Germany, [sfkirsch@uni-wuppertal.de](mailto:sfkirsch@uni-wuppertal.de).

<sup>2</sup> Institute of Physics, Faculty of Physics, Astronomy and Informatics, Nicolaus Copernicus University in Toruń, Grudziadzka 5, 87-100 Torun, Poland, [beata@fizyka.umk.pl](mailto:beata@fizyka.umk.pl).

SUBJECTS: dyes and pigments, polymer, Glaser coupling, pH-activated switching, thin films.

The search for new family compounds for applications as biological markers, in optics, optoelectronics are the subjects of interest of many researches. Actually, rubazonic acids and their derivatives are promising organic dyes in materials science and engineering. Firstly, rubazonic acid was synthesized and reported by Ludwig Knorr in the 1887's. <sup>[1]</sup> Nevertheless, the lack of information is observed. We developed and described experimentally simple and highly practical one-pot procedure for their synthesis starting from easily accessible 1H-pyrazol-5(4H)-ones. <sup>[2]</sup> The desirable properties of these materials are attributed to their capability for sensing various anions as well as in color photography application <sup>[3][4]</sup>



Scheme 1: The rubazonic acid derivatives (a), homopolymer of rubazonic acid (b), polyetheretherketone-rubazonic acid copolymer (c).

In this work, we report preliminary results for the synthesis of new rubazonic acids with structural variations (Scheme 1a) that have been systematically studied. New homopolymers of rubazonic acid (Scheme 1b) were synthesized by Glaser coupling. The polyetheretherketone-rubazonic acid copolymers (Scheme 1c) were synthesized by nucleophilic aromatic substitution reaction and characterized. The optical properties were investigated for new rubazonic acid derivatives and for polymers based on rubazonic acid in solution and in thin films.

<sup>[1]</sup> L. Knorr, *Liebigs Ann. Chem.* 1887, 238, 137.

<sup>[2]</sup> M. L. Tong, L.T. Leusch, K. Holzschneider, S.F. Kirsch, *J. Org. Chem.* 2020, 85, 6008–6016.

<sup>[3]</sup> H. Kala, *Die Pharmazie*, 1963, 18–21 29.

<sup>[4]</sup> SE Sheppard, RC Houck, *Photographic antihalation layer*, 1940, US, 2203659.