

Modification of Metal Surfaces by Optically Active [7]Helicene Derivatives for Molecular Sensing.

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Dostupný z http://www.nusl.cz/ntk/nusl-389955

Dílo je chráněno podle autorského zákona č. 121/2000 Sb.

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Datum stažení: 21.05.2024

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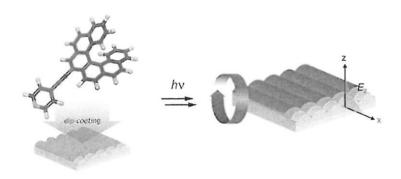
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Helicenes and their functional layers have a great application potential in many fields of research due to their unique electronic and chiroptical properties [1]. Although they were successfully applied in molecular recognition [2] and sensing [3], their use in surface plasmon polariton-based detection is exceptional indeed.

With regard to above mentioned fact. new 9-(pyridylethynyl)[7]helicenes were firstly prepared and fully characterized in this study. Consequently, they were successfully separated to their (P)- and (M)enantiomers using a preparative HPLC with chiral stationary phase. These optical antipodes were advantageously used for modification of silver plasmon active nanogratings suitable for a SERS-based detection of (bio)molecules. Properties of such nanostructures were studied using different spectro- and microscopic techniques. As proved by UV-Vis spectrometry, a change of plasmon resonance wavelength position and intensity was observed and indicated the appearance of chiral surface plasmon polarization (Fig. 1).

Fig. 1



This work was supported by the Czech ministry of Industry and Trade (reg. No. FV 10082).

- 1 Gingras, M. Chem. Soc. Rev. 2013, 42, 1051.
- 2 Weix, D. J.; Dreher, S. D.; Katz, T. J. J. Am. Chem. Soc. 2000, 122, 10027.
- 3 Storch, J.; Žádný, J.; Strašák, T.; Kubala, M.; Sýkora, J.; Dušek, M.; Církva, V.; Matějka, P.; Krbal, M.; Vacek, J. Chem. Eur. J. 2015, 21, 2343.