

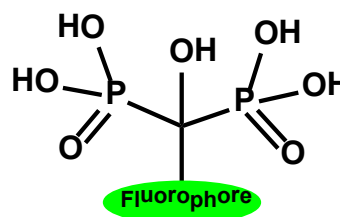
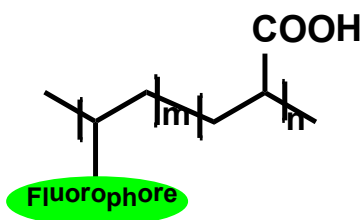
8th European Chemistry Congress

June 21-23, 2018 | Paris, France

Design and synthesis of fluorescent-tagged scale inhibitors

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In the field of water treatment scale inhibitors are gaining an increasing interest mostly in the last decade. The water treatment technologies use fluorescence phenomenon for the oil components control in wastewater, gaseous oxygen monitoring in waste waters, water leaks in industrial pipelines, for the total bacterial count and for on-line scale inhibitors content monitoring. Besides, the problem of a scale inhibition mechanisms is still actual and requires applications of fluorescent-tagged inhibitors. Both phosphonate- and polymer-based scale inhibitors are gaining nowadays a very broad spectrum of applications in water treatment technologies. However, the “on line” monitoring of an antiscalant content in an aqueous phase is still a challenge for researchers. A possible solution is provided by the fluorescent markers added to the feeding water. These can be either an antiscalant-tagged, or may represent the independent species. In this research we present the results of recent studies performed in our research group. We managed to synthesize two different types of fluorescent-tagged inhibitors: polymer- and phosphonate-based ones (scheme 1), both containing naphthalimide as a fluorescent core. Fluorescent scale inhibitors of both types were thoroughly tested in our research group and showed excellent results providing ability to use them for on-line scale inhibitors content monitoring. The authors would like to thank the Russian Foundation for Basic Research (Project No. 17-08-00061) and partly the Russian Scientific Foundation (Project 18-13-00144).



Biography

Maxim Oshchepkov has graduated from Dmitry Mendeleev University of chemical technology of Russia and completed his PhD at the age of 26 years from A N Nesmeyanov Institute of Organoelement Compounds of Russian Academy of Sciences (INEOS RAS). He is the deputy director of PJSC Fine Chemicals R&D Centre. He has published more than 15 papers in journals with a high impact factor and has more than 5 patents.

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