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ECO-FRIENDLY NON-BIocide-RELEASE ANTIFOULING COATINGS FOR WATERBORNE SYSTEMS

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Environmental concerns are leading to efforts among the industrial and research communities in order to face the actual challenges. One of the biggest concerns is bio-contamination on submerged industrial surfaces promoted by the spontaneous colonization of aquatic organisms (biofouling), which is associated to serious environmental and economic penalties, as well as health risks on several applications (e.g. water treatment and desalination units, marine structures). In particular, for the marine transportation, it can promote premature substrate deterioration and drag resistance increases up to 40%, leading to more subsequent fuel consumption and Greenhouse gas emissions (up to 250% by 2050). The impact of this marine biofouling is huge. For instance, a total cost of 150 billion USD per year just for transport delays, hulls maintenance has been reported for marine transportation. On the other hand, the aquatic ecosystem has been suffering the impact of conventional biofouling control strategies, which are based on the continuous release of toxic biocides into the waters, implying significant ecotoxicity effects and extending their action to an area far beyond the initial surfaces bio-decontamination. A recently developed non-biocide release alternative, able to control this bio-burden on submerged surfaces, showed the potential to embrace a new generation of non-toxic strategies. Briefly, it comprised the development of functional isocyanate reactive biocides able to be tethered in polymeric coatings, hence providing an antifouling action by contact and minimizing the toxic side-effects allied to the conventional release strategies. This approach can provide a low environmental impact and promising antifouling efficacies at both static and dynamic marine aquatic conditions. In addition, the ability of this strategy to be tailored in order to generate antimicrobial coated filters for water bio-decontamination is also given its first footsteps.

BIOGRAPHY

Elisabete R Silva holds a PhD in Chemical Engineering by Instituto Superior Técnico, University of Lisbon, Portugal in 2009. She has been carrying out Research and Development activities in public institutions and chemical companies mostly focused in the fields of environmental friendly and sustainable technologies for pollutants remediation. She was honored as Young Researcher at UTL/Deloitte Contest in 2010 and in 2013 received a distinction for the progress in engineering technologies by advances in Engineering. She is a Researcher and Invited Assistant Professor at Faculdade de Ciências, University of Lisbon, Portugal since 2013. She has been actively involved as PI/Team member of national and international projects, supervising MSc, Master and PhD students. She has over 8 patents, 4 book chapters and 26 publications in international journals that have been cited over 215 times. She is currently the Guest Editor of the Novel Marine Antifouling Coatings special issue for the open access *Journal Coatings* (ISSN 2079-6412).

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