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Book of Abstracts

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P 29 **Versatile Access to Functionalized Aminobenzynes Enabled by Meta-Selective C-H Borylation**
Eun-Hye Lim

P 30 **Copper-Catalyzed Chan-Lam Type Coupling Involving Nitrene Intermediates for the Synthesis of *N*-Alkenylarbamates**
Suchan Gong

P 31 **Hydrophilic BIPHEPHOS Ligands for Pd-mediated Cysteine Allylation of Peptides and Proteins in Water**
Mark Bieber

P 32 **Late stage ^{14}C-labeling of solid-phase supported peptides *via* Pd-catalyzed alkoxycarbonylation**
Vitus J. Enemærke

P 33 **Combining borane catalysis with NHC catalysis for the activation of tertiary amines and aldehydes**
Kirti

P 34 **Design and Synthesis of Bio-inspired Energetic Nucleobase Derivatives**
Irina Novosjolova

P 35 **Multifunctional Purine Derivatives with Corrosion Inhibiting and Antimicrobial Properties**
Armands Sebris

P 36 **A Synergistic Catalysis Pathway to the Construction of Chiral Spiro-Isoxazolone Scaffolds**
Martin Kamlar

P 37 **Methylenecyclopropane ring-expansion with SO_2**
Emanuels Šūpulnieks

P 38 ***Furcellaria lumbricalis* as a valuable source of bioactive compounds**
Viktors Kumpiņš

P 39 **Convergent and Modular Synthesis of Tunable Pentasubstituted Chiral Cyclopentadienyl Ligands towards Performant C-H Activation Catalysts**
Bram Van Den Bossche

P 40 **1,2-Silyl Shift – Ritter Reaction Cascade for the Synthesis of Dihydroisoquinolines and Allylamine Derivatives**
Turks M.

P 41 **Mechanistic Discovery of [1,5]-Brook Rearrangement Leading to Imidobenzyne Formation**
Yeon Ji Shin

P 42 **Cascade Cyclization Involving 1,2-Silyl Shift – a New Synthetic Approach to Fused Heterocycles**
Artjoms Ubaidullajevs

Multifunctional Purine Derivatives with Corrosion Inhibiting and Antimicrobial Properties

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Corrosion is a chemical process, which leads to deterioration of materials and is caused by the surrounding environment. It can be managed by removing promoting factors, however, these factors often cannot be changed in many applications, so alternative prevention methods such as alloying, surface coating, cathodic protection, and the use of corrosion inhibitors are employed. Corrosion inhibitors form a thin protective layer on the metal surface through adsorption or by interacting with metal atoms on the surface. Most efficient inhibitors possess Lewis basic groups, which contain heteroatoms (N, O, P, S) or π electron systems.[1] Recently, heterocyclic systems have been recognized as promising scaffolds for the design of organic corrosion inhibitors. Also, some purine derivatives have been studied as corrosion inhibitors, and exhibit high corrosion inhibition efficiency – up to 97%.[2] Herein, we propose novel purine derivatives containing nitrogen-rich functional groups as corrosion inhibitors (Figure 1). The target compounds are functionalized with a tetraethylene glycol moiety to ensure solubility in water. Purine derivatives have also been studied for their antibacterial properties, so such compounds may be corrosion inhibitors with dual functionality. Various 2-triazolylsubstituted purine derivatives, have been reported to exhibit antibacterial and antiviral properties,[3] so we aniticipate antimicrobial properties for our structures as well.

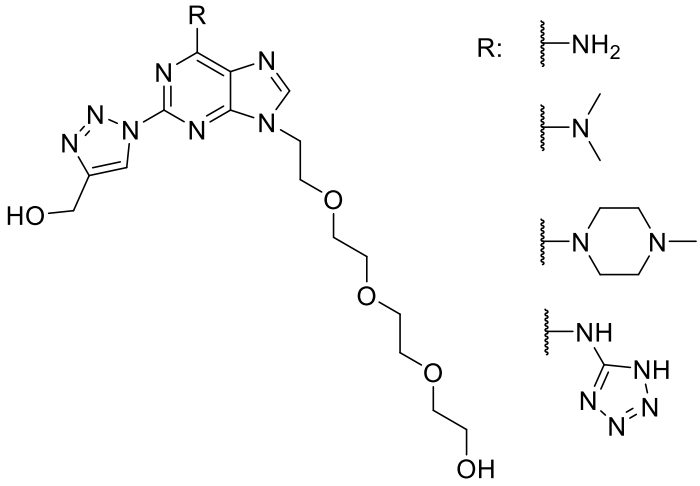

Figure 1: Proposed structures of purine derivatives as corrosion inhibitors.

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