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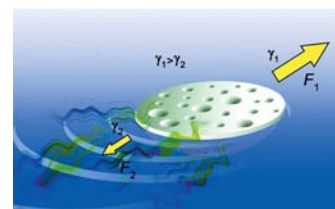


### Self-Propelling Motors

G. Zhao, T. H. Seah, M. Pumera\*

#### External-Energy-Independent Polymer Capsule Motors and Their Cooperative Behaviors

**Chemical shepherding:** A millimeter-sized polymer capsule motor with specific features and functionalities runs without any external energy sources or the consumption of external fuels (see figure). Long-range interaction behaviors and surface-cleaning effects due to the chemotaxis effect are demonstrated when the capsule is functionalized with sodium dodecyl sulfate (SDS).



*Chem. Eur. J.*  
DOI: [10.1002/chem.201101450](https://doi.org/10.1002/chem.201101450)

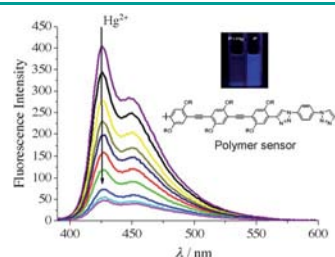


### Fluorescence Sensors

Y. Wu, Y. Dong, J. Li, X. Huang, Y. Cheng,\* C. Zhu

#### A Highly Selective and Sensitive Polymer-based Fluorescence Sensor for Hg<sup>2+</sup>-Ion Detection via Click Reaction

**Mercury rising:** A Highly Selective and sensitive polymer-based fluorescence sensor synthesized using click reactions affords the most-pronounced fluorescence response to Hg<sup>2+</sup> ion.



*Chem. Asian J.*  
DOI: [10.1002/asia.201100534](https://doi.org/10.1002/asia.201100534)

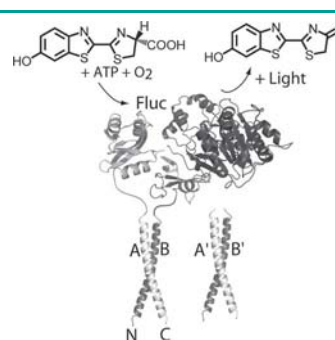


### Caspases

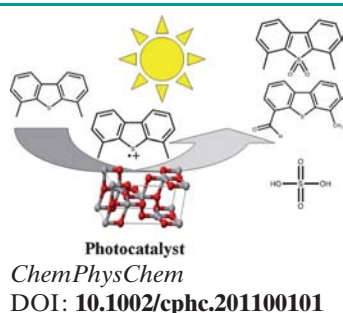
S. S. Shekhawat, S. T. Campbell, I. Ghosh\*

#### A Comprehensive Panel of Turn-On Caspase Biosensors for Investigating Caspase Specificity and Caspase Activation Pathways

**Profiling caspases:** A comprehensive panel of genetically encoded turn-on caspase sensors with a luminescent readout was developed (see figure). The panel of bipartite caspase biosensors was utilized to systematically investigate caspase cleavage specificity profiles. Utilizing this panel of caspase biosensors we identified cross-talk between inflammatory and executioner caspases.



*ChemBioChem*  
DOI: [10.1002/cbic.201100372](https://doi.org/10.1002/cbic.201100372)

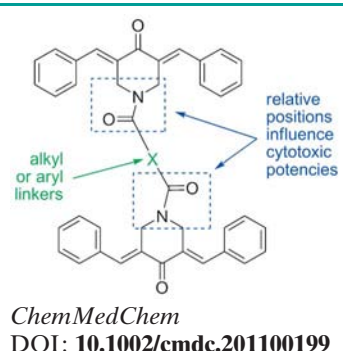
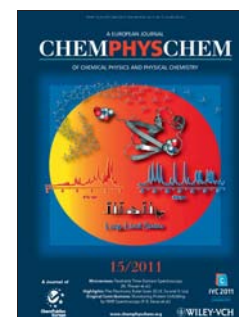


### Photocatalysis

A. Samokhvalov\*

#### Heterogeneous Photocatalytic Reactions of Sulfur Aromatic Compounds

**Cleaning up:** Sulfur aromatic compounds are found in petroleum, bitumen, tar sands, gasoline, diesel, jet, heating fuels, and waste waters. This review provides a critical analysis of physicochemical properties, classes of photocatalysts, mechanisms of reactions, intermediates, selectivity of reactions, and adsorption complexes of sulfur aromatic compounds studied by experiment and quantum chemistry (see picture).

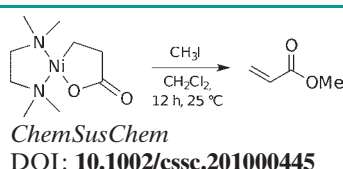
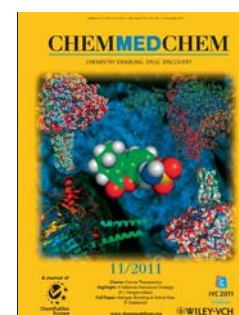


### Cytotoxic Agents

S. Das, U. Das, A. Varela-Ramírez, C. Lema, R. J. Aguilera, J. Balzarini, E. D. Clercq, S. G. Dimmock, D. K. J. Gorecki, J. R. Dimmock\*

#### Bis[3,5-bis(benzylidene)-4-oxo-1-piperidinyl]amides: A Novel Class of Potent Cytotoxins

**More is Better:** Compounds were designed to explore the concept of cytotoxic synergism, where doubling alkylation capacity leads to more than a two-fold increase in potency. Their cytotoxicity against three tumor cell lines was evaluated, with one-third of the results confirming our hypothesis. The most potent agents were tested against an extended panel of human cancers and showed differentiation between adherent and non-adherent cells. Flow cytometry was used to propose a probable mechanism of action.

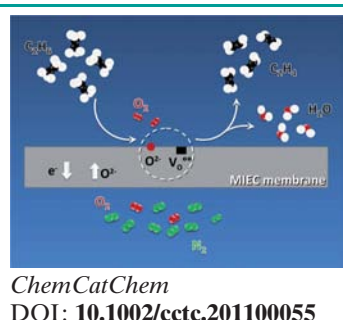
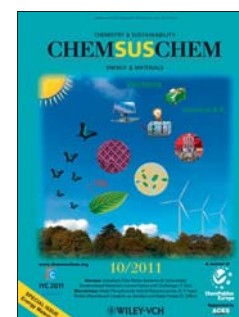


### Carbon Dioxide Conversion

S. Y. T. Lee, M. Cokoja, M. Drees, Y. Li, J. Mink, W. A. Herrmann, F. E. Kühn\*

#### Transformation of Nickelalactones to Methyl Acrylate: On the Way to a Catalytic Conversion of Carbon Dioxide

**Mu-nick:** The methyl iodide-mediated ring opening of nickelalactones, which can be formed by oxidative coupling of carbon dioxide and ethylene at Ni<sup>0</sup> complexes, induces β-H elimination, producing methyl acrylate in yields of up to 56 %. This reaction is found to be very sensitive to the ligands coordinated to the central nickel atom.

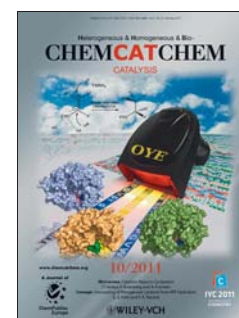


### Membrane Reactors

M. P. Lobera, S. Escolástico, J. M. Serra\*

#### High Ethylene Production through Oxidative Dehydrogenation of Ethane Membrane Reactors Based on Fast Oxygen-Ion Conductors

**Straight on through to the other side:** Catalytic membrane reactors based on solid-state oxygen conductors enabled us to achieve high ethylene productivity through the oxidative dehydrogenation of ethane. The selectivity is maximized by preventing the direct contact of molecular oxygen and hydrocarbons, by properly selecting the temperature and inlet gas flow rates, and by using methane as a diluting agent.



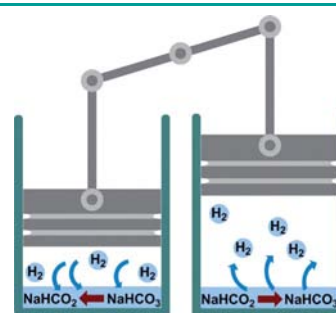


### Hydrogen Storage

G. Papp,\* J. Csorba, G. Laurenczy, F. Joó\*

#### A Charge/Discharge Device for Chemical Hydrogen Storage and Generation

**Soda stream:** Sodium bicarbonate was cyclically hydrogenated in aqueous solution to sodium formate at 100 bar  $H_2$  in the presence of a  $Ru^{II}$ -sulfonated phosphine catalyst. The system functions as a true charge/discharge device for storage and delivery of hydrogen without the need for isolation of either formate or bicarbonate.



*Angew. Chem. Int. Ed.*  
DOI: 10.1002/anie.201104951

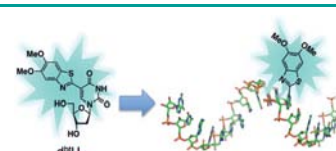


### Fluorescent DNA Probes

W. Hirose, K. Sato, A. Matsuda\*

#### Fluorescence Properties of 5-(5,6-Dimethoxybenzothiazol-2-yl)-2'-deoxyuridine ( $d^{bt}U$ ) and Oligodeoxyribonucleotides Containing $d^{bt}U$

The photophysical properties of 11 substituted 5-(benzothiazol-2-yl)-2'-deoxyuridine derivatives and oligodeoxyribonucleotides (ODNs) containing  $d^{bt}U$  are described. The fluorescence properties of the ODNs containing 16 combinations of 5'- $X^{bt}U$ -3' and 5'- $btUY$ -3' were compared, and  $d^{bt}U$  was found to be a very promising new fluorescent analogue while showing low sensitivity to its microenvironment in DNA.



Low sensitivity to its microenvironment in DNA  
*Eur. J. Org. Chem.*  
DOI: 10.1002/ejoc.201100818

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