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Systems Chemistry
B. A. Grzybowski et al.

Cofactor Biosynthesis
T. B. Rauchfuss

Renewable Resources
D. Quinzler and S. Mecking

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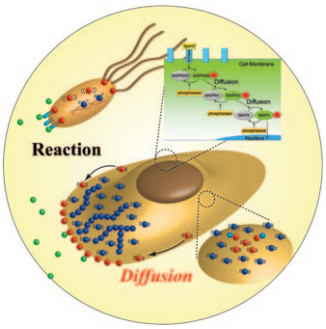
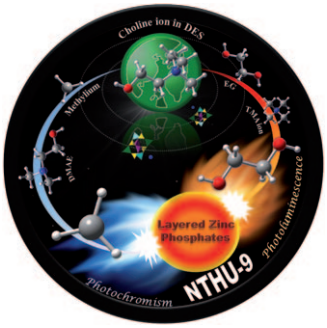
Cover Picture

Ivan M. Kempson* and Dermot A. Henry

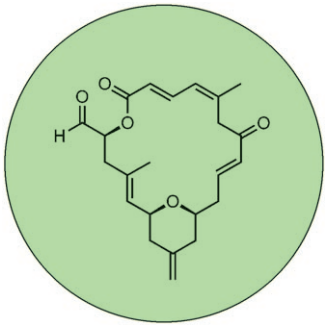
An eighty-year-old mystery is solved in the retrospective post-mortem examination of the iconic race horse Phar Lap. As reported by I. Kempson and D. Henry in their Communication on page 4237 ff., distinct trends in arsenic distributions and chemistry consistent with ingestion of the toxin hours before Phar Lap's excruciating and rapid demise. This unique case of hair analysis reveals metabolic and hair-incorporation processes associated with his arsenic consumption.



Reaction-Diffusion Systems
B. A. Grzybowski and co-workers analyze in their Review on page 4170 ff. the role of active transport, diffusion, and specific transport mechanisms in intracellular reactions. How long does each process last and how much energy is necessary?



Ionothermal Synthesis
In their Communication on page 4200 ff., S.-L. Wang and co-workers present a photochromic layered zinc phosphate NTHU-9. This compound was synthesized in a choline chloride/oxalic acid deep eutectic solvent, which also acted as methylating agent and source of ethylene glycol.



Total Synthesis
The Communication by D. Lee co-workers on page 4261 ff. describes the total synthesis of (−)-dactylolide. The key features include an Alder–ene reaction, rhenium-mediated transport of an allylic alcohol, and ring-closing metathesis to form an 18-membered lactone.