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..... Jiyang Men, Jianfeng Guo, Weihong Zhou,  
Nanyan Dong, Xilun Pang, and Baojiao Gao 1889

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- Heterogeneous amino acid-based tungstophosphoric acids as  
efficient and recyclable catalysts for selective oxidation of  
benzyl alcohol  
..... Xiaoxiang Han, Yingying Kuang, Chunhua Xiong,  
Xiujuan Tang, Qing Chen, Chin-Te Hung,  
Li-Li Liu, and Shang-Bin Liu 1914
- One-pot synthesis of high fructose corn syrup directly from  
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..... Yong Sun, Caixia Xiong, Huihui Chen,  
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- A simple route for preparing Au/mesoporous silica yolk/shell

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..... Byeong Sub Kwak, No-Kuk Park, Jeom-In Baek,  
Ho-Jung Ryu, and Misook Kang 1936
- Catalytic combustion of volatile aromatic compounds over  
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Shengming Chen, Zhaojie Jiao, and Jianmin Ren 1944

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- Co-processing of heavy oil with wood biomass using super-  
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..... Doo-Wook Kim, Anton Koriakin,  
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- Preparation and characterization of polymer-coated mesoporous  
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