

sci.energy.hydrogen: Re: University reactor shows promise for `hydrogen economy'

## Re: University reactor shows promise for `hydrogen economy'

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**From:** charliw2 (*charliw2\_at\_ev1.net*)

**Date:** 06/06/04

Date: Sun, 6 Jun 2004 10:33:08 -0500

Bill Ward wrote:

> *On Sun, 6 Jun 2004 02:32:11 +0000 (UTC),*

> *swanson@nospam\_on.net (Eric Swanson) wrote:*

>

> *<snip>*

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>> *Science, Vol 280, Issue 5363, 560-564, 24 April 1998*

>> *[DOI: 10.1126/science.280.5363.560]*

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>> *Platinum Catalysts for the High-Yield Oxidation of Methane to a*

>> *Methanol Derivative*

>>

>> *R. A. Periana \*, D. J. Taube, S. Gamble, H. Taube, T. Satoh, H. Fujii*

>>

>> *Platinum catalysts are reported for the direct, low-temperature,*  
>> *oxidative conversion of methane to a methanol derivative at greater*  
>> *than 70 percent one-pass yield based on methane. The catalysts are*  
>> *platinum complexes derived from the bidiazine ligand family that are*  
>> *stable, active, and selective for the oxidation of a carbon-hydrogen*  
>> *bond of methane to produce methyl esters. Mechanistic studies show*  
>> *that platinum(II) is the most active oxidation state of platinum for*  
>> *reaction with methane, and are consistent with reaction proceeding*  
>> *through carbon-hydrogen bond activation of methane to generate a*  
>> *platinum-methyl intermediate that is oxidized to generate the methyl*  
>> *ester product.*

>>

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> *How much sulfur does the flared natural gas usually*  
> *contain? Would there be enough to cause problems by*  
> *poisoning the Pt catalyst?*

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> *Regards,*

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> *Bill Ward*

That's a very good question, Bill. I suspect that the amount of sulfur depends on which oil field it comes from. Assuming that Pt catalyst would be poisoned by the sulfur, the natural gas would have to be treated before contacting the Pt.