

# Re: Aqua regia

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*Source:* <http://sci.tech-archive.net/Archive/sci.chem/2005-05/msg00007.html>

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- *From:* Uncle Al <[UncleAl0@xxxxxxxxxxxxxx](mailto:UncleAl0@xxxxxxxxxxxxxx)>
  - *Date:* Sat, 30 Apr 2005 17:32:55 -0700
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Ryn wrote:

>  
> I was flipping through my chemistry book a couple of days ago and was  
> looking at a problem about the dissolving of gold.  
>  
> It supplied this equation:  
>  
>  $\text{Au(s)} + 3\text{NO}_3\text{-(aq)} + 6\text{H}^+\text{(aq)} \rightarrow (\leftarrow\rightarrow?) \text{Au}^{3+}\text{(aq)} + 3\text{NO}_2\text{(g)} + 3\text{H}_2\text{O(l)}$   
>  
> When I look at this equation, all it uses is the Nitric acid. Yet, gold  
> doesn't react with nitric acid alone. Is the  $\text{Cl}^-$  a catalyst? I looked  
> on the internet (though I admit not much because I can only really get  
> to google, none of the other pages) and I couldn't find an explanation  
> for this phenomenon.

Dissolving gold requires oxidation and complexation. Saline in air will do it, so will cyanide and air. Aqua regia is a heck of a lot of acid,  $\text{NOCl}$  and maybe  $\text{Cl}_2$  (oxidizing agents), and a heck of a lot of chloride (complexant).

Writing an equation doesn't mean it happens, thermodynamically or kinetically. BTW, your equation isn't balanced for material. Where did the three extra  $\text{H}^+$  come from?

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Uncle Al

<http://www.mazepath.com/uncleal/>

(Toxic URL! Unsafe for children and most mammals)

<http://www.mazepath.com/uncleal/qz.pdf>

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Re: Aqua regia

◇ *From:* Ryn

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