Arsenic removal studies

**Kinetics studies** were carried out in 2 L bechers filled with 1.7 L solutions (1 ppm As, deionised water, pH = 7, 0.1 g L\(^{-1}\) NaHCO\(_3\)). Adsorbents were placed in a basket, and ratio set at 1 g L\(^{-1}\), mixing by a magnetic stirrer was set at 300 rpm.

- Bayoxide performs well for both arsenic species. Very high removal rates
- Raw dolomite does not adsorb well As(III) or As(V) at pH = 7 in 24 hr
- Charred dolomite removes gradually As(III), up to 50% in 24 hr. As(V) is lowered to 100 - 200 ppb in 20 min by precipitation while pH raises from 7 to 12
- Fe coated charred dolomite removes well both arsenic forms. As(III) decreases by 63% and As(V) is completely removed in less than 4 hours, which is faster rate observed

**Concentration studies** were carried out in 60 mL glass flasks filled with 50 mL of arsenic solutions (1 - 100 ppm As, deionised water, pH = 7, 0.1 g L\(^{-1}\) NaHCO\(_3\)). Adsorbent ration was fixed at 1 g L\(^{-1}\). Samples were taken after 72 hours on a horizontal shaker set at 100 rpm.

- Charred dolomite is very efficient at high arsenic concentration for both arsenic species. The Fe coated charred dolomite behavior is following the same trend. Bayoxide performs well at lower concentration
- The high removal capacity of charred dolomite based adsorbent at 100 ppm is due to precipitation (see table above)
- Lower initial concentration should be used in future works to reflect better the removal capacity of these adsorbents under natural condition ([As] < 1000 ppb)

**Removal capacity at 100 ppm**

<table>
<thead>
<tr>
<th>Adsorbent</th>
<th>Of As(III) in mg As.g(^{-1})</th>
<th>Of As(V) in mg As.g(^{-1})</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw dolomite</td>
<td>13,75</td>
<td>36,05</td>
</tr>
<tr>
<td>C. dolomite</td>
<td>89,37</td>
<td>44,2</td>
</tr>
<tr>
<td>Fe C. C. dolomite</td>
<td>84,41</td>
<td>34,45</td>
</tr>
<tr>
<td>Bayoxide</td>
<td>18,6</td>
<td>2,95</td>
</tr>
</tbody>
</table>

**SEM pictures**

**References**