**FLOCCULATION—JAR TEST**

混凝反应-烧杯检测法

***What is the “jar test” used for?***

* To have an effective flocculation process we should adjust the quantity of reagent (aluminium sulphate) added to raw water.
* If we add too little quantity of reagent the flocs are not formed, if we add too much quantity the process is not effective and we can have excess of aluminium in treated water (toxic).
* The jar test allows finding out how much flocculant we should add to raw water to have an effective flocculation. Besides, it shows if there is any problem in the floc formation (e.g. because the pH value is inadequate)

**PRACTICAL EXAMPLE OF JAR TEST**

**Material:**

•6 bottles/jars with 1 litre of raw water each

•Stock aluminium sulphate solution (MS) 1% = 10g/litre ≈ 1 spoon/l

•Turbidity meter (to check final turbidity < 5 NTU)

•Syringe to measure volumes

•Watch

•Wand to stir

|  |  |  |  |
| --- | --- | --- | --- |
| **Flocculent Mother Solution of 1%** | | | |
| **Tank Volume (Ltr)** | **Tank** | **Flocculent Powder** | |
| ***Tank*** | ***Weight*** | ***Spoons*** |
| *1 ltr* | 10 gm | 1 |
| *10 ltr* | 100 gm | 7 |
| *20 ltr* | 200 gm | 14 |
| *30 ltr* | 300 gm | 21 |
| *40 ltr* | 400 gm | 28 |
| *50 ltr* | 500 gm | 35 |
| *60 ltr* | 600 gm | 42 |
| *70 ltr* | 700 gm | 49 |
| *80 ltr* | 800 gm | 56 |
| *90 ltr* | 900 gm | 63 |
| *100 ltr* | 1000 gm | 70 |
| *110 ltr* | 1100 gm | 77 |
| *120 ltr* | 1200 gm | 84 |

**Analysis:**

* Add MS (2 ml, 4 ml, 6 ml, 8 ml, 10 ml, 12 ml) in the raw water bottles
* Stir for about 10 min. and leave the solution to settle for 30 min.
* Measure the turbidity of the jars

*Turbidity after 30 min*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Jar 12 ml  12ml | Jar 10 ml  10ml | **Jar 8 ml**  **8ml** | Jar 6 ml  6ml | Jar 4 ml  4ml | Jar 2 ml  2ml |
| < 5 NTU | < 5 NTU | **< 5 NTU** | 20 NTU | 50 NTU | 100 NTU |

Choose the right jar (the one with fewer reagent that achieves a turbidity < 5 NTU, in the example Jar 8 ml)