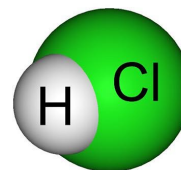


Pure HCL from Muriatic Acid

29 March 2016



Muriatic acid is a type of hydrochloric acid (HCL) used in industry world-wide for various purposes. Besides containing hydrochloric acid, it has other stuff we don't want in our MMS1 or CDH solutions. Diluted to 10% (or 4%) to make CDS, muriatic acid is probably fine to use as is.

Some years ago a fellow posted a [YouTube video](#) on how to extract clean HCL from muriatic acid and I decided to try his method. I did not get the expected results, so I experimented until I came up with a method and equipment that worked for me.

My goal was to get 4% HCL which can be used to make MMS1, 3000 ppm CDS and CDH. 5% and 10% HCL are not needed to make these Sodium Chlorite Solutions (SCS).

Solution quantities, size, and probably shape, of the glass receiver and reactor vessels will make a difference in the percentage of HCL obtained using this method. Here is what I chose to use for this experiment.



Muriatic acid to HCL equipment.
* 250 ml glass clamp-lid jar.
* 75 ml 2.5" x 2" glass votive candle holder.
* LDPE kitchen wrap clamp-lid to jar seal.
(Large piece folded many times to form a thick, soft seal which will compress when lid is closed with jar wire clamp to keep HCL fumes from escaping jar.



Day 3, note the condensation inside the receiver glass jar.

Originally I used a silicone lid-to-jar seal, but discovered that HCL destroyed it! Looking online I found that LDPE is not affected by HCL and is what I had on hand to make a suitable gasket. Ordinary kitchen plastic wrap is LDPE plastic.

Three tests were performed using 31.45% muriatic acid. One quart cost \$3.49 purchased from a hardware store. Test time periods were 11.5 days for test #1 and 9 days for tests #2 & #3. Shorter time periods were not tested.

Not having any means to measure HCL strength, by trial and error, using the first batch of cleaned-up HCL, I diluted it until I had reached what I thought was 4% HCL. I determined that by making CDS according to the [CDS dual-infusion overnight method](#) which uses 4% HCL as the activator. That CDS method is sensitive to small changes in ingredient quantities so I thought this would work to determine when 4% HCL was found.

For each batch of cleaned-up HCL made, a batch of CDS was made and CLO₂ concentration was measured with a photometer.

This is the recipe I used:

- 50 ml of 31.45% Muriatic Acid in the 250 ml jar
- 50 ml of Distilled Water (DW) in the 75 ml jar
- Average time to extract clean HCL is 10 days
- Dilute HCL with 1/3 DW. (Example: 42.7 ml HCL + 14.2 ml DW = 56.9ml)

Test #	CDS ppm
1	3228
2	2838
3	3175
Average CDS ppm -->	3080

It seems the undiluted HCL percentage is about 5.3%.

When diluted the total 4% HCL quantity is about 55 ml. That is enough to make 1+ liters of 3000 ppm CDS or CDH. One quart of 31.45 % muriatic acid can produce, using the appropriate CDS and CDH recipes, about 23 liters of 3000 ppm CDS or CDH.

If you live where clean HCL is not available, this method should help you.

Be sure to use appropriate skin & eye protection and do not breath muriatic acid vapors.

--CL