

## Technical Data Sheet • CHEMEON® Etch 2300(A)

### Description:

Etch additive with grain refiners and chelators intended to be combined with the customer's sodium hydroxide to produce a good general purpose alkaline etch. The etch additive is used at 0.5 to 2 gallons per 100 lbs of dry caustic. The etch solution is operated at 120 °F to 150°F for 2 to 10 minutes.

### Operating Conditions:

Method of Application:	Immersion
Concentration:	0.5 - 2 gal per 100 lbs dry caustic 5 - 10 oz/gal (38 - 75 g/L) dry caustic depending on the dissolved aluminum concentration
Time:	2 to 10 minutes
Temperature:	120° to 150° F
Equipment material:	Steel or stainless steel

### Solution Control:

Active Caustic Concentration

New Bath:

1. Pipet 10 mL of a cooled sample taken from the etch tank into a 250 mL beaker.
2. Add ~50 mL of DI water and 4 drops of phenolphthalein indicator.
3. Titrate with 1.0 N HCl until the pink color disappears.
4. Record the mL of 1.0 N HCl titrated.
5. Calculation:

$$\text{Caustic (oz/gal)} = (\text{mL of 1.0 N HCl}) \times 0.5$$

$$\text{Caustic (g/L)} = (\text{mL of 1.0 N HCl}) \times 4.0$$

Used Bath:

1. Filter a sample from the etch bath through #54 filter paper.
2. Pipet a 10 mL sample of the clear filtered bath into a 250 mL beaker.
3. Add ~50 mL of DI water.
4. Titrate with 1.0 N HCl until the first permanent cloudiness or turbidity is detected.

**NOTE:** With each drop of acid some precipitate will be formed but this will re-dissolve on shaking. When the precipitate does not dissolve the end point has been reached.

5. Record the mL of 1.0 N HCl used to reach the permanent precipitate.
6. Calculation:

$$\text{Caustic (oz/gal)} = (\text{mL of 1.0 N HCl}) \times 0.5$$

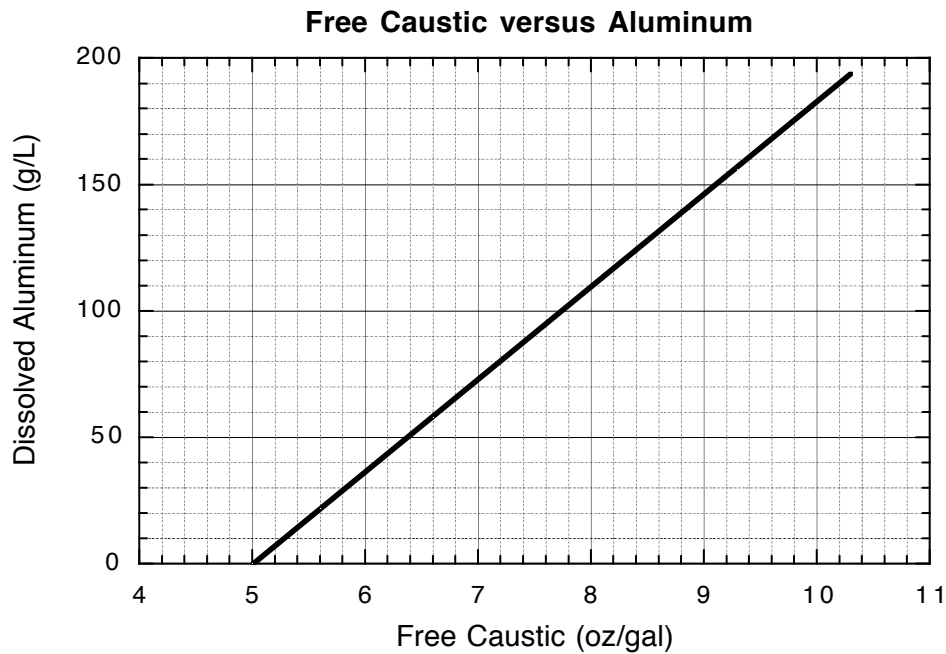
$$\text{Caustic (g/L)} = (\text{mL of 1.0 N HCl}) \times 4.0$$

7. To the above sample add 4 drops of phenolphthalein indicator.
8. Titrate with 1.0 N HCl until the color changes from pink to colorless.
9. Record the mL of 1.0 N HCl titrated.
10. Calculation:

$$\text{Concentration of Aluminum (g/L)} = (\text{mL of 1.0 N HCl}) \times 2.67$$

$$\text{Concentration of Aluminum (oz/gal)} = (\text{mL of 1.0 N HCl}) \times 0.36$$

The free caustic concentration should increase as the concentration of dissolved aluminum increases according to the graph below. The CHEMEON® Etch 2300(A) concentration is dependent on the concentration of free caustic in the etch solution.



Aluminum Concentration (g/L)	Free Caustic Concentration (oz/gal)	Free Caustic Concentration (g/L)	CHEMEON® Etch 2300(A) Concentration (% by volume)
0	5	38	0.16 – 0.64
25	5.7	43	0.18 – 0.72
50	6.4	48	0.20 – 0.80
75	7.1	53	0.22 – 0.88
100	7.7	58	0.24 – 0.97
125	8.4	63	0.26 – 1.05
150	9.1	68	0.28 – 1.13



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#### CHEMEON® Etch 2300(A)

1. Pipet 1 mL of the etch bath into a 250 mL flask.
2. Pipet 25 mL of 0.1 N ceric sulfate into the 250 mL flask.
3. Add ~50 mL of DI water, 20 mL of 50% sulfuric acid and a stir bar.
4. Boil gently for 20 minutes without mixing.
5. Remove from heat and let cool
6. Add 4 drops of ferroin indicator and titrate immediately with 0.1 N ferrous ammonium sulfate (FAS).
7. Record the number of mL of FAS to change color from blue to red as A.
8. Calculation:  
$$\text{CHEMEON® Etch 2300(A) (\% by volume)} = [25 - (A \times \text{Factor})] \times 0.31$$

**NOTE:** Ferrous Ammonium Sulfate solutions are not stable for extended periods of time. Standardization is usually required at least bi-weekly to determine its effective concentration. The Factor above, is thus incorporated in order that a more accurate determination may be obtained.

**Determination of Factor:** Using a volumetric pipet, transfer 25 mL of 0.1 N ferrous ammonium sulfate (FAS) to a clean 250 mL flask. Add 20 mL of 50% H<sub>2</sub>SO<sub>4</sub> and 50 mL of DI water. Add 3 to 4 drops of ferroin indicator, titrate with 0.1 N ceric sulfate from red to blue. Record the number of mL of 0.1 N ceric sulfate necessary to reach the endpoint.

Calculation:

$$\text{Factor} = (\text{mL of 0.1 N ceric sulfate})/25$$

#### Physical and Safety Data:

CHEMEON® Etch 2300(A) is a clear liquid.

CHEMEON® Etch 2300(A) is non hazardous. Do not take internally. In case of contact with eyes flush with water for 15 minutes.

#### Packaging:

55 Gallon drum

#### Storage:

CHEMEON® Etch 2300(A) should be stored in a cool, dry area away from organic material. Keep drums closed when not in use.



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## **Waste Disposal:**

Etch solutions containing CHEMEON® Etch 2300(A) may require neutralization to a specified pH range depending on Federal, State, and local waste treatment regulations.

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