

***INSTRUCTIONS:***  
**QUANTITATIVE DETERMINATION OF KLA-CURE**

A simple test has been developed for quantitative determination of excess Kla-Cure concentration in mud. This test relies on the interaction between Kla-Cure and highly anionic resin which forms white precipitates with Kla-Cure under acidic conditions, and the amount of precipitates formed (or cloudiness) is a function of the concentration of Kla-Cure. Materials needed and testing procedures are given below.

**I. Equipment and Materials**

A. Kla-Cure Indicator Solution

1. To 170 ml deionized water, add 5 g Kla-Cure Indicator

B. Standard Kla-Cure solutions

1. Prepare 5- 100 ml of 2, 3, 4 and 5 ppb Kla-Cure standard solutions using deionized water.

C. Two 10-ml graduated cylinders for collecting mud filtrate

D. Two 2-ml pipettes for transferring filtrate

E. Ten to fifteen 10-ml vials

F. Six glass jars for standard Kla-Cure solutions

G. 50-ml of 0.5 N HCl solution

**II. Procedures**

A. Preparation of Standards for Cloudiness Comparison

1. Label 5 vials “2 ppb”, “3 ppb”, “4 ppb”, “5 ppb”, and “Blank” Pipette 2 ml Indicator Solution to each vial and add 3 drops of 0.5 N HCl solution to each.
2. Add 2 ml deionized water to the vial labeled “Blank”. No precipitates should form in the blank solution.
3. Add 2 ml of “2 ppb” Kla-Cure standard solution to the vial labeled “2 ppb”. Very light colored (white) precipitates should form after 5 – 10 minutes.
4. Repeat step 3 by adding 2 ml of each 3, 4 and 5 ppb Kla-Cure standard solution to matching vials. Cloudiness formed in each vial should increase with increasing concentration of Kla-Cure.

5. Save all the 5 vials for quantitative comparison. The color of the precipitates may change with time, therefore, new mixtures should be prepared every 4 – 5 days when the color changes.

#### B. Determination of Excess Kla-Cure in Mud

1. Collect about 4 – 6 ml clear mud filtrate using an API filter press. Discard the spurt loss if it is cloudy.
2. To clean vial, add 2 ml Kla-Cure Indicator Solution and 3 drops of 0.5 N HCl, then add 2 ml clear mud filtrate. If no precipitates form after 10 minutes, there is not enough Kla-Cure in the filtrate (e.g., <1.0 ppb, see Comments below).
3. If white precipitates form after 5 – 10 minutes, compare the cloudiness with the five known mixtures to estimate the Kla-Cure concentration.
4. If the cloudiness developed is more than that of the “5 ppb” standard solution, then dilute the mud filtrate 50% using deionized water and repeat the test. Make sure to multiply the dilution factor at the end of the test.

### III. Comments

- A. The minimal amount of Kla-Cure that can be detected using this method is about 1 ppb. When the concentration of Kla-Cure is less than 1 ppb, a simple clay-flocculation test can be performed to verify its presence or absence in the filtrate:
  1. First, prepare a dilute bentonite suspension by dispersing approximately 3 g M-I Gel in 350 ml freshwater. Transfer 2 ml of dilute bentonite suspension to a clean vial, and add 3 drops of 0.5 N HCl, then add 2 ml of mud filtrate and shake the suspension gently. If Kla-Cure is present in the filtrate, clay particles would be flocculated immediately. No flocculation indicates very low or no Kla-Cure.
- B. The Kla-Cure test may be affected by mud salinity, pH, and darkness of mud filtrate. High salinity will inhibit the formation of precipitates, thus test result may be less accurate when the filtrate contains more than 20,000 mg/l chloride. Dark mud filtrate will severely interfere with the detection and comparison of the precipitates. In addition, if the mud contains a large amount of lignite, the humic acid fraction could be precipitated out under the acidic test condition. Since the cationicity of Kla-Cure depends on pH, it is likely that muds with a higher pH (>10.0) may show a larger amount of excess Kla-Cure than those with a lower pH (>9.0). Therefore, the Kla-Cure content should be checked with mud pH being maintained in a given range.
- C. The interaction between Kla-Cure and the Indicator may take several hours to complete, thus the cloudiness of the mixture may appear to increase slightly after several hours; however, most of the precipitates form during the first 10 minutes if there is sufficient amount of Kla-Cure.
- D. Keep the Kla-Cure Indicator and Indicator Solution in an airtight container to prevent discoloration. The Indicator Solution will turn yellow after 7 – 10 days, and small amounts of sodium bisulfite (-0.5 g) can be added to restore the color.



For more information, please contact us:

[ExpotechUSA](#)  
[10700 Rockley Road](#)  
[Houston, Texas 77099](#)  
[USA](#)

[281-496-0900 \[voice\]](#)

[281-496-0400 \[fax\]](#)

E-mail: [sales@expotechusa.com](mailto:sales@expotechusa.com)

Website: [www.ExpotechUSA.com](http://www.ExpotechUSA.com)