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A DISCUSSION OF THE PAPER "THE EFFECT OF ILMENITE PLANT DUSTS ON RHEOLOGICAL PROPERTIES OF CLASS G OILWELL CEMENT SLURRIES" BY A. SAASEN AND P.A. LOG*

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Drs. Saasen and Log (1) have evaluated two ilmenite plant dusts as an alternative to barite as a weighting agent in heavyweight HSR Class G oilwell cement slurries. The ilmenite plant dusts both had a similar particle size distribution to ground bauxite and slightly greater densities. However, changes in consistency with time due to chemical reactions involving the plant dusts within the cement slurries rendered these dusts less favourable as weighting agents than bartie, which was not affected in this manner. Better consistency was obtained in the Class G oilwell cement slurry with the multicyclone dust than with the filter dust, where no success was achieved in dispersing and/or retarding this slurry to an acceptable consistency.

Clearly the two dust compositions used, the filter dust (with crystalline content containing 50% ilmenite $FeTiO_3$ and 30% pseudobrookite Fe_2TiO_5) and the multicyclone dust (with 50% pseudobrookite and only 20% ilmenite in the crystalline components), both of which also included large fractions of amorphous materials, were examined as collected and had not apparently been optimised for practical usage as heavyweight additives in the experiments undertaken.

The basic requirements for weighting agents in well cementing involve having the following properties (2-4):

- s.g.s within the range 4.2-5.0 for most purposes.
- low water requirements.
- minimal effects upon the pumping time for the cement slurry and the compressive strength of the hardened cement in the annulus.
- uniform particle size range from batch-to-batch, which is similar to the cement particle size range, so as to avoid segregation or bleeding from larger particles and increased slurry viscosity from smaller particles during pumping into position in the annulus.
- chemically inert to the hydrating cement.
- compatible with the other cement slurry additives.
- non-interference with well logging, the recording of one or more physical parameters of the geological formations as a function of depth in the boreholes.
- the need ordinarily to achieve cement slurry densities up to 2.4 kg/litre (20 lb/U.S. gallon).

*CCR 26(5), 707-715 (1996)

The ability to utilise such dusts in oilwell cement slurries would be environmentally beneficial. It might be worthwhile investigating further ilmenite dust samples from the different filter systems and blends thereof, to see whether an optimum composition or compositional range can be achieved that can regularly produce a suitable consistency and not undergo any significant chemical reaction within the Class G cement slurry prior to thickening and hardening arising. Were this to be achieved, then such ilmenite dusts could be employed without detriment as weighting agents for heavyweight oilwell cement slurries downhole. Alternatively, especially if the above should prove not to be altogether successful, these ilmenite dusts might find application in well cementing formulations at lower concentrations as viscosifying agents in cementing through weak or unconsolidated formations. This possibility would be worth checking out in the laboratory.

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