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ACID/BASE-REACTION

Magnesium Oxychloride Cement

Magnesium oxychloride cement (MOC), also known as Sorel cement, is based on the aqueous reaction between magnesium chloride ($MGCl_2$) and magnesium oxide (MgO). The major hydration products 5Mg(OH)2·MgCl2·8H2O and $3Mg(OH)_2 \cdot MgCl_2 \cdot 8H_2O$ are the main sources of mechanical strength.

Advantages of MOC

- Low alkalinity
- Rapid hardening rate
- Low thermal conductivity
- High compressive strength
- Good resistance to abrasion
- Proper adhesion and bonding ability

Ideal for P&A Applications

For a project regarding radioactive-waste disposal, we employed a MOC-based system as cement plug in the open-hole section of the well. Intensive lab experiments proceeded this field application including tests on compressive strength development, as well as slurry consistency and rheology.

Conclusions from the FES-Lab

- Low slurry density of 1.6 kg/L
- Favorable rheology for easy pumping
- Adjustable thickening time with standard cement retarder
- Fast compressive strength development, even at 27°C

Conclusions from the Field

- Small foot-print on location
- Mixable and pumpable with standard cementing equipment
- Effective P&A application and good feedback from client
- Easy to remove from mixing tank