**Supplemental material**

**Supplemental material for “Enhanced cuttings transport efficiency of water-based muds using (3–Aminopropyl) triethoxysilane on polypropylene-nanosilica composite”**

**Table A.1**

**Table A.1** Product description of some chemicals.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Technical features | PE-b-PEG | PP | TEOS | APTES | PHPA |
| Formula | C32H66O2 | (C3H6)n | C8H20O4Si | C6H17NO3Si | C8H9NO2 |
| Weight (g/cm³) | ― | 0.855 | 0.933  | 1.027 | 1.244 |
| Formula weight (g/mol) | 466.87  | 42.08 | 208.34 | 179.29 | 151.163 |
| Appearance (form) | Beads | Beads | Liquid | Liquid | Powder |
| Appearance (Color) | Yellow | Pale White  | Colorless | Colorless | Tan |

**Table C.1**

**Table C.1** Technical specification of cuttings transport flow loop.

|  |  |
| --- | --- |
| Flow loop variables | Design Range |
| Flow loop length | 10.67 m (35–ft.)  |
| Annular test section | 4.88 m (16–ft.) |
| Outer pipe internal diameter | 60.96 m (2.4–in.) |
| Inner pipe outer diameter | 30.48 m (1.2–in.) |
| Drill pipe circulation speed  | 0–200 rpm (150 rpm used) |
| Wellbore deviation | Horizontal to vertical |
| Eccentricity  | 0 to 100 % (0% eccentricity used) |
| Maximum capacity of liquid ultrasonic flow meter | 200 ft/min (60.96 m/min) |
| Pump controller (speed and pressure) | 200–220 volt; 0.5–2 HP |
| Variable speed centrifugal pump | 2–HP (1.49 kW) |
| Flow rate range | 20–42 L/min (0.02–0.042 m³/min) |
| Cuttings size range  | 0.50–3.20 mm (0.020–0.126 in.) |
| Average cuttings diameter range | 0.68–3.00 mm (0.027–0.118 in.) |
| Mud tank capacity | 150 L (0.94 barrels) |
| Cuttings separator | 0.2 mm (200 µm wire mesh) |