

MICRO-CURE E2

Reservoir Remediation Treatment
Surfactant System



MICRO CURE TM Properties

- A translucent solutions
- Thermodynamically stable solutions
- Macroscopically homogeneous
- Microscopically heterogeneous

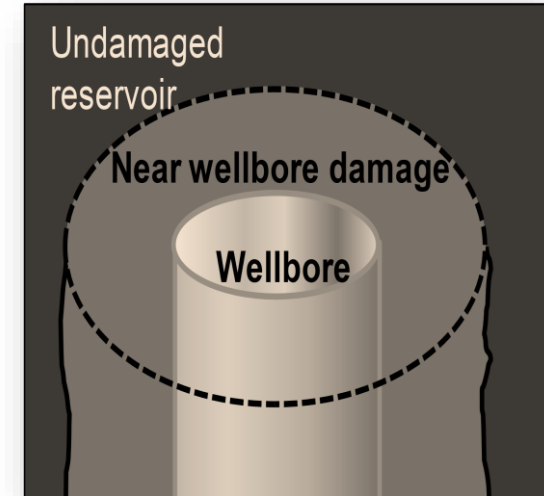
Composition:

- Non-polar phase
- Brine (may includes acids)
- Surfactant (usually two or more) & Co-Surfactants.



MICRO CURE™ Applications

- OBM / WBM / Sludge damage
- Emulsion damage
- Crude oil damage (depositions)
- Ahead fluid for acid treatment
- Perforation Fluid
- New wells / old wells



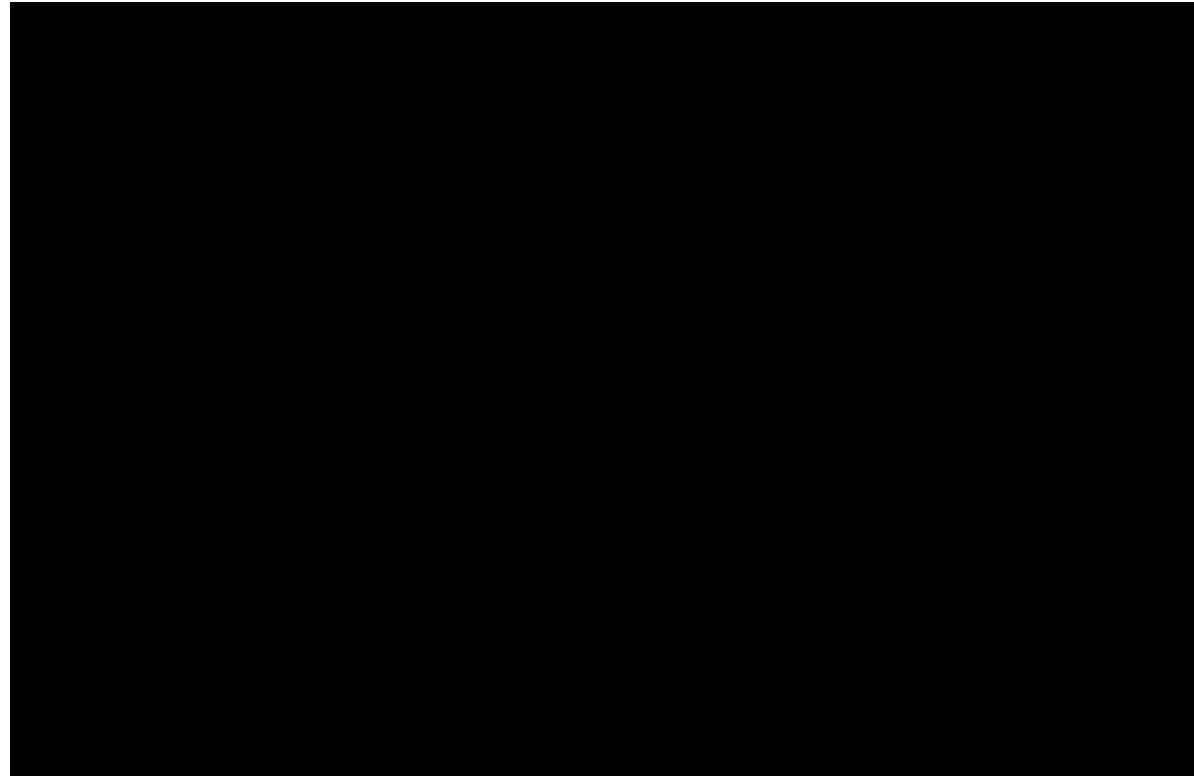
Crude Oil / OBM Sludge

Post-treatment

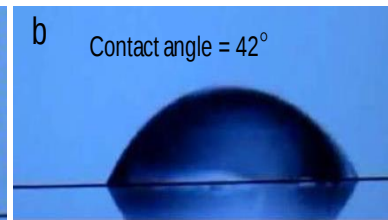
MICRO CURE™ Vs. Traditional Treatments

MICRO CURE™	Traditional Treatments
▪ Non-aromatic ▪ It may contain an acid ▪ Surfactant and Co-surfactant ▪ “Ultra-low Interfacial Tension” ○ Self diffusing ○ Spontaneous action ○ Requires no energy ▪ Mobilizes and fluidize most Asphaltene and Paraffin ▪ High flash point >100°C	▪ Aromatic solvents ▪ Acids, water, alcohols, glycols ▪ Surfactants ▪ Not known for diffusive properties ▪ Not known for ultra-low Interfacial Tension ▪ Not known for Asphaltene mobilization

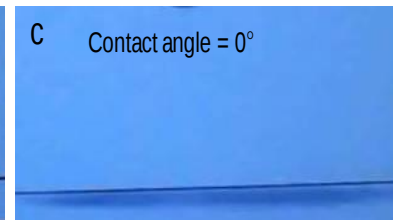
MICRO CURE TM Effect on Surface Tension



Untreated Glass

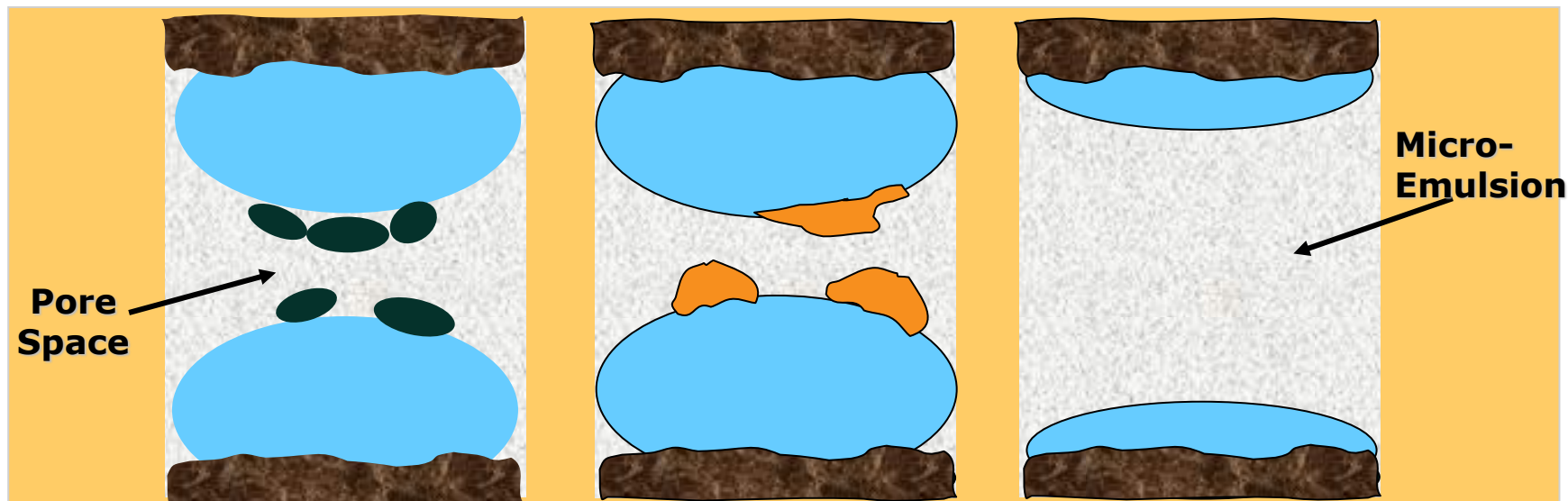


Treated
W/ OBM



Treated
W/ MICRO CURE

Wettability & Relative Permeability



- Poorly Water-wet Rock
 - Trapped Oil
 - Poorly Water-wet Rock
 - Emulsion Blockage
 - 100% Water-wet Rock
 - Increased Pore Space
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- **MICRO-CURE™** solubilizes trapped oil
 - **MICRO-CURE™** removes damaging emulsions
 - **MICRO-CURE™** reduces bound H₂O layer

MICRO CURE™ – Case Histories

1- OBM Damage Removal - Gas Producer/EGY

- Drilling Phase
 - Lower zone lost 1100 bbl of OBM
- Proposed Solutions
 - Solution 1 : solvent + de-emulsifier + agitation + squeezing
 - Solution 2 : solvent + de-emulsifier + acetic acid + agitation + squeezing
 - **Solution 3 : MICRO CURE™ + no agitation needed + diffusion**



MICRO CURE™ – Case Histories

2- Oil Well Remediation

Paraffin/Scale Deposition Damage in Crude Oil Producer

	History					1 ST Xylene	2nd Xylene	Micro-Cure	
	Clean-up Jul-08	31-Jul-09	16-Aug-09	20-Sep-09	19-Oct-09	08-Jan-10	14-Jan-10	16-Jan-10	22-Jan-10
K _h Total mD.M	11,200	10,200	8,970	8,590	10,800	6,300	2,400	11,500	10,600
Skin	22	34	41	76	118	166	45	15	8
PI m ³ /d	45	44	36	19	15	8	10	103	99

	History						No Xylene	Micro-Cure
	Clean-up	26-May-09	24-Jun-09	31-Jul-09	16-Aug-09	25-Oct-09	04-Jan-10	23-Jan-10
K _h Total mD.m	9,607	6,820	6,990	4,970	4,880	3,510	2,670	9,540
Skin	20.5	36	10.7	12.7	13.1	13.7	8.9	16.2
PI m ³ /d	60	52	47	41	40	28	18	75

Baker Hughes 