

Cesium Formate Product Specifications

Measured Property	Typical Solution Basis Formulation	Typical Maximum Specification	Comment
Density			
<i>specific gravity S.G.</i>	2.3	2.4	
<i>pounds per gallon ppg</i>	18.8	20	
pH	10.00 - 11.00	11.00	10:1 Dilution Reading/Fisher pH Paper
Turbidity		< 30 NTUs	Solution Clarity
Particle Size Analysis		average particle size < 0.5 μm	Malvern Particle Size Analyzer
Viscosity @25 °C	5.65 cps		Density Dependent
Fann 35 @25 °C			
Elemental (ppm)			
Σ Rb, K, Na, Li		50,000	Dependent on Base Mineral Stream
Ba, Sr	< 50	< 100	Dependent on Manufacturing Process
Σ Ba, Sr, Ca, Mg	< 50	< 100	-
Al	25	< 40	-
Fe	1	< 10	Elements from Base Mineral
Si	8	< 50	-
B	3	< 5	-
Mo	4	< 5	-
Tl	< 10	< 50	-
Σ Cu, Cr, Ni	< 3	< 5	-
Mn	< 1	< 5	-
P	5	< 10	-
SO ₄	150	< 200	Dependent on Manufacturing Process
Cl	500	< 1000	
Pb		< 1	
Additives (ppm)			
CO ₃	1290	3680	Added for Buffering Capacity
Citric Acid	150	150	Added Immediately After Final Filtration
Insolubles	100	< 500	Measured at 25°C

NOTE: Final specifications and chemical properties will vary on base ore source and for customized user requirements.



Cesium/Potassium Formate Product Specifications

Measured Property	Typical Solution Basis Formulation	Typical Maximum Specification	Comment
Density			
<i>specific gravity S.G.</i>	1.65	2.2	
<i>pounds per gallon ppg</i>	13.75	18.33	
pH	10.00 - 11.00	11.00	10:1 Dilution Reading/Fisher pH Paper
Turbidity		< 30 NTUs	Solution Clarity
Particle Size Analysis		average particle size < 0.5 μm	Malvern Particle Size Analyzer
Viscosity @25 °C Fann 35 @25 °C		5.65 cps	Density Dependent
Elemental (ppm)			
Cs	8,300	74,700	
K	68,400	7,600	
Σ Rb, Na, Li	35,000	50,000	Dependent on Base Mineral Stream
Ba, Sr	< 50	< 100	Dependent on Manufacturing Process
Σ Ba, Sr, Ca, Mg	< 50	< 100	-
Al	25	< 40	-
Fe	1	< 10	Elements from Base Mineral
Si	8	< 50	-
B	3	< 5	-
Mo	4	< 5	-
Tl	< 10	< 50	-
Σ Cu, Cr, Ni	< 3	< 5	-
Mn	< 1	< 5	-
P	5	< 10	-
SO ₄	150	< 200	Dependent on Manufacturing Process
Cl	500	< 1000	
Pb		< 1	
Additives (ppm)			
CO ₃	1290	3680	Added for Buffering Capacity
Citric Acid	100	150	Added Immediately After Final Filtration
Insolubles	100	< 500	Measured at 25°C

NOTE: Final specifications and chemical properties will vary on base ore source and for customized user requirements.



Formate Brine Buy-Back Specifications

Measured Property	Original Solution Basis Formulation	Return Specification For Buy-Back	Comment
Density			
<i>specific gravity S.G.</i>	1.65	1.65	
<i>pounds per gallon ppg</i>	13.75	13.75	
<i>suspended solids</i>		1.5%	
<i>hydrocarbon content</i>		0.5%	
pH	10.00 - 11.00	10.00 to 11.00	10:1 Dilution Reading/Fisher Paper
Turbidity		< 30 NTUs	Solution Clarity
Particle Size Analysis		average particle size < 0.5 µm	Malvern Particle Size Analyzer
Viscosity @25 °C	cps	cps	Density Dependent
Fann 35 @25 °C			
Elemental (ppm)			
Cs	8,300	8,300	
K	68,400	68,400	
Σ Rb, Na, Li	35,000	50,000	Dependent on Base Mineral Stream
Ba, Sr	< 50	< 100	Dependent on Manufacturing Process
Ca	<10	< 50	5 times original spec
Σ Ba, Sr, Mg	< 50	< 100	
Al	25	< 40	
Fe	1	< 10	Elements from Base Mineral
Si	8	< 50	-
B	3	< 5	-
Mo	4	< 5	-
Tl	< 10	< 50	-
Σ Cu, Cr, Ni	< 3	< 5	-
Mn	< 1	< 5	-
P	5	< 10	-
SO ₄	150	< 200	5 times original spec
Cl	500	< 2500	5 times original spec
Pb		< 1	
Additives (ppm)			
CO ₃	1290	3680	Added for Buffering Capacity
Citric Acid	100	150	Added Immediately After Final Filtration
Insolubles	100	< 500	Measured at 25°C

NOTE: Cabot Specialty Fluids reserves the right not to buy-back any fluid that exceeds these specifications.