

Supplementary Materials for

**Prediction Models of Barite Crystallization and
Inhibition Kinetics: Applications for Oil and Gas
Industry**

Chong Dai^{†,*1}, Zhaoyi Dai^{†,*1}, Yue Zhao¹, Xin Wang¹, Samiridhdi Paudyal¹, Saebom Ko¹, Amy
T. Kan¹, and Mason Tomson¹

1. Department of Civil & Environmental Engineering,

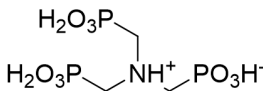
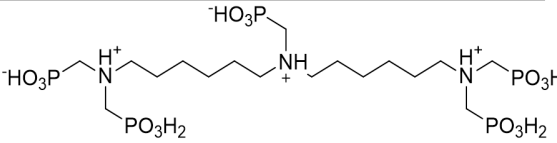
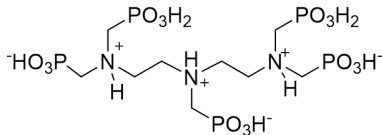
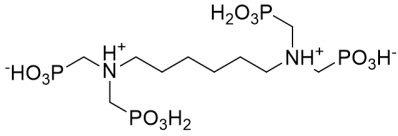
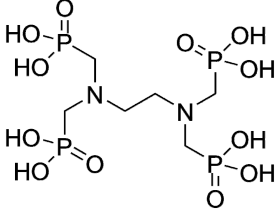
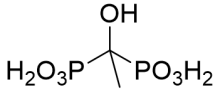
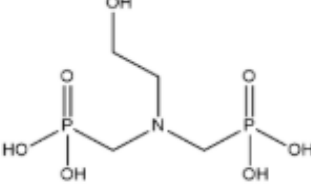
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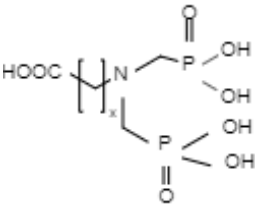
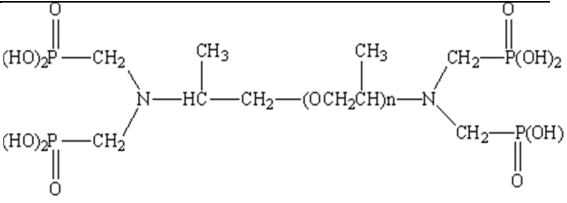
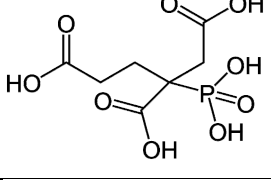
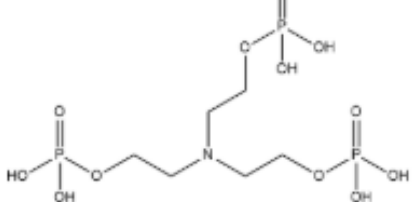
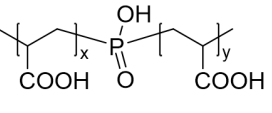
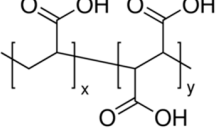
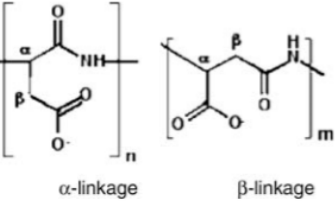
[†] **Equal Contribution**

Summary

5 pages included 2 tables

Table S1. Detailed Information of 18 common inhibitors used in barite inhibition experiments

#	Inhibitor Abbreviate	Chemical Name	Chemical structure
1	NTMP	Nitrilo tri(methylene phosphonic) acid	
2	BHPMP	Bis-hexamethylene triamine-penta(methylene phosphonic) acid	
3	DTPMP	Diethylene triamine-penta(methylene phosphonic) acid	
4	HDTMP	Hexamethylene diamine-tetra(methylene phosphonic) acid	
5	EDTMP	Ethylenediamine tetra(methylene phosphonic) acid	
6	HEDP	1-hydroxyethylidene-1,1-diposphonic acid	
7	HEBMP	Hydroxyethyl amino bis(methylene phosphonic) acid	

8	PhnAA	Phosphonated amino acid	
9	PAPEMP	Polyamino polyester methylene phosphonic acid	
10	PBTC	2-phosphono 1,2,4-butane tricarboxylic acid	
11	PE	Triethanolamine Phosphate ester	
12	PPCA	Phosphinopolycarboxylic acid	
13	MAC	Phosphorous incorporated maleic acid polymer	
14	PASP	Polyaspartatic acid	

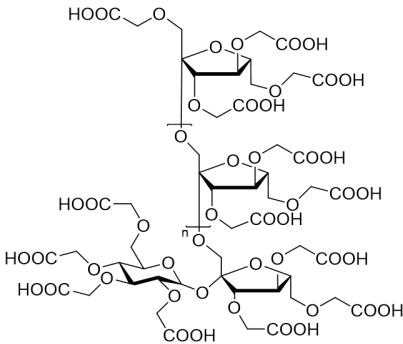
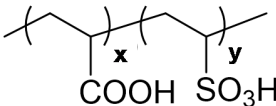
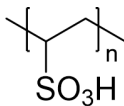
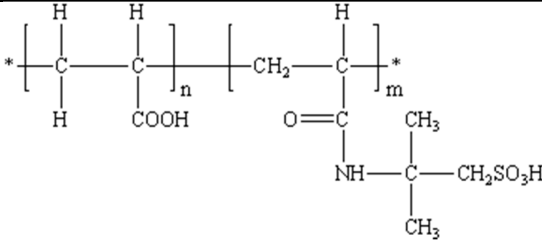
15	CMI	Carboxymethylinulin (0.25 substitution)	
16	SPCA	Sulfonated polycarboxylate	
17	PVS	Polyvinyl sulfonate	
18	AA/AMPS	Sulfonated polyacrylic acid copolymer	

Table S2. The name and numbers of functional groups for 18 inhibitors

Inhibitors	MW	#amino- phosphonate (c1)	#C- phosphonate (c2)	#N- C-OH (c3)	#phosphonate -ester (c4)	#C- O-C (c5)	# carboxylate (c6)	# sulfonate (c7)
NTMP	299	3						
BHPMP	685	5						
DTPMP	573	5						
HDTMP	492	4						
EDTMP	436	4						
HEDP	206		2					
HEBMP	249	2		1				
PhnAA	270	2					1	
PAPEMP	600	4				2.5		
PBTC	270		1				3	
PE	389				3			
PPCA	3800						51	
PMAC	188						3	
PASP	114						1	
SPCA	180						1	1
PVS	107							1
AA/AMPS	279						1	1
CMI	274					1.25	0.75	