

# UCLA Study Overview

## Paper Reference

### **Impact of Conventional Water Treatment Coagulants on Mineral Scaling in RO Desalting of Brackish Water**

Myung-man Kim, James Au, Anditya Rahardianto, Julius Glater, Yoram Cohen, Fredrick W. Geringer, and Christopher J. Gabelich

*Ind. Eng. Chem. Res.*, **2009**, 48 (6), 3126-3135 • DOI: 10.1021/ie800937c • Publication Date (Web): 10 February 2009

“In the first phase of the study, six candidate commercial antiscalants were first ranked with respect to their scale suppression performance, utilizing model solutions containing the scalants of concern found in CR water, based on bulk crystallization induction time measurements. Subsequently, RO membrane scaling tests were carried out with the **most promising antiscalant candidate** to quantify the extent of membrane scale suppression and antagonistic effects due to expected coagulant carryover. Scale development and its suppression were characterized via permeate flux decline measurements as well as via direct optical imaging and SEM analysis of the RO membrane surface.”

# Flocon Vs. Competition

Antiscalant comparisons by  
independent source

UCLA Study – performed February 2009

# Antiscalants tested in UCLA screening

Table 1. Properties of Antiscalants Used in the Present Study

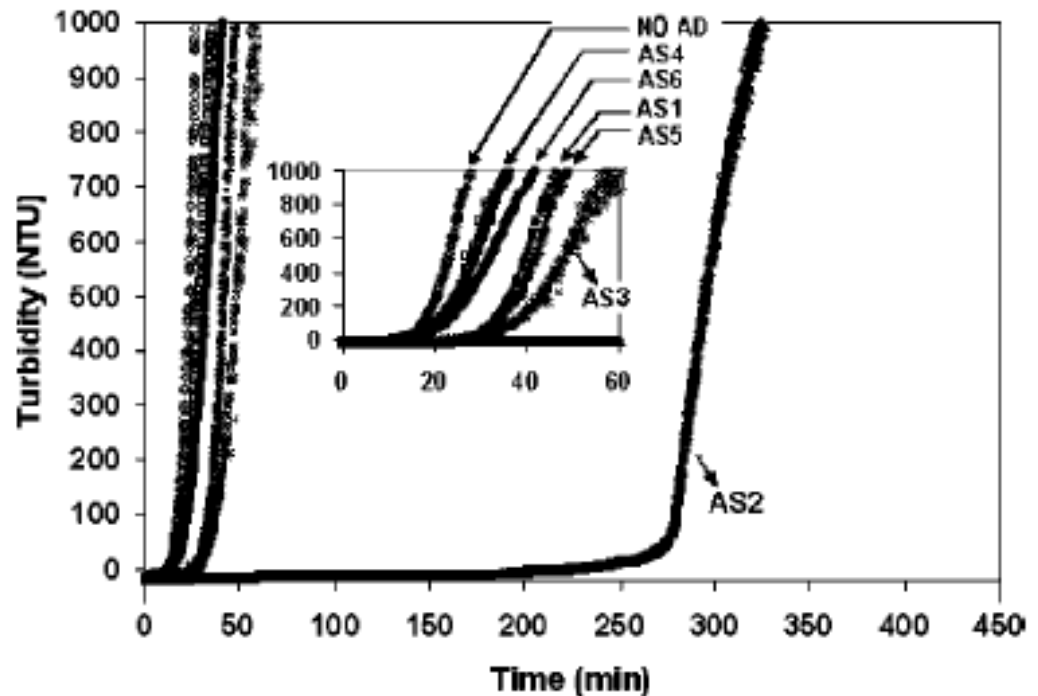
antiscalant	name	supplier	specific gravity (20 °C)	active ingredient	residual solids (wt %)
AS1	PC-391	Nalco (Naperville, IL)	1.1	N/A <sup>a</sup>	17
AS2	Flocon 260	Biolab Water Additives (Tucker, GA)	1.16	polycarboxylic	54
AS3	Vitec 3000	Avista Technology (San Marcos, CA)	1.15–1.25	Phosphonate blend	40
AS4	Pretreatplus	King Lee Tech (San Diego, CA)	1.06	N/A	22
AS5	Pretreatplus MDC 700	GE Water & Process Technologies (Minnetonka, MN)	1.13	N/A	28
AS6	Kochtreat 75	Koch Membrane (Wilmington, MA)	1.1–1.2	1-hydroxyethane-1,1-diphosphonic acid	13

<sup>a</sup> Information unavailable.

# UCLA Testing results

*Turbidity testing for bulk crystallization was done for the range of antiscalants being tested. This is a measure of scale inhibition properties of the antiscalants.*

*AS2 antiscalant (Flocon 260) outperformed the other antiscalants by a wide margin. 7x-10x times longer induction time was provided by Flocon 260*



**Figure 4.** Turbidity plots for bulk crystallization from model solution A (Table 2) at 2 mg/L antiscalant dosage and without added antiscalant (NO AD). (The insert provides an enlarged view of the turbidity curves to the left.)

# UCLA Antiscalant study

**Flocon 260** was determined to be the “most promising antiscalant candidate” from the tests performed by UCLA and was used in the remainder of the testing studies performed by UCLA