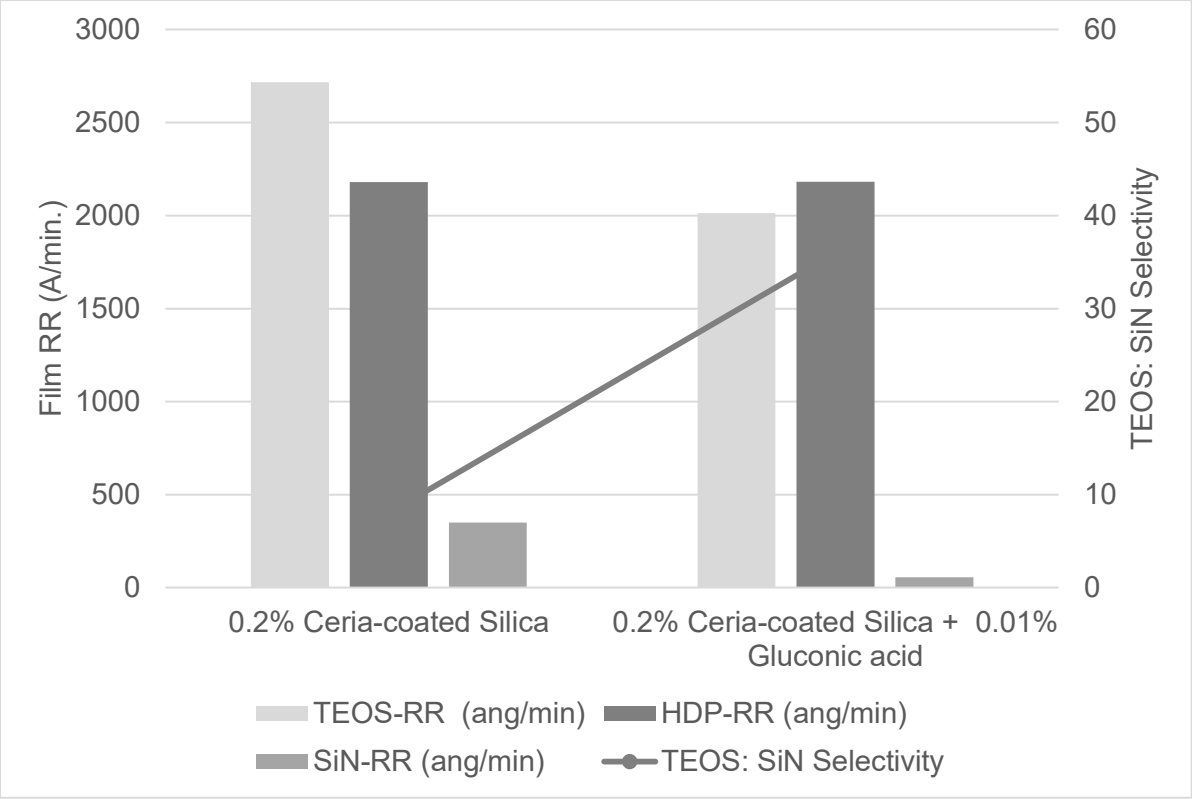
3000
2500
2000
1500
1000
500
0
Film RR (A/min.)
60
50
40
30
20
10
0
TEOS: SiN Selectivity
0.2% Ceria-coated Silica
0.2% Ceria-coated Silica + 0.01% Gluconic acid
TEOS-RR (ang/min)
HDP-RR (ang/min)
SiN-RR (ang/min)
TEOS: SiN Selectivity

Figure 1

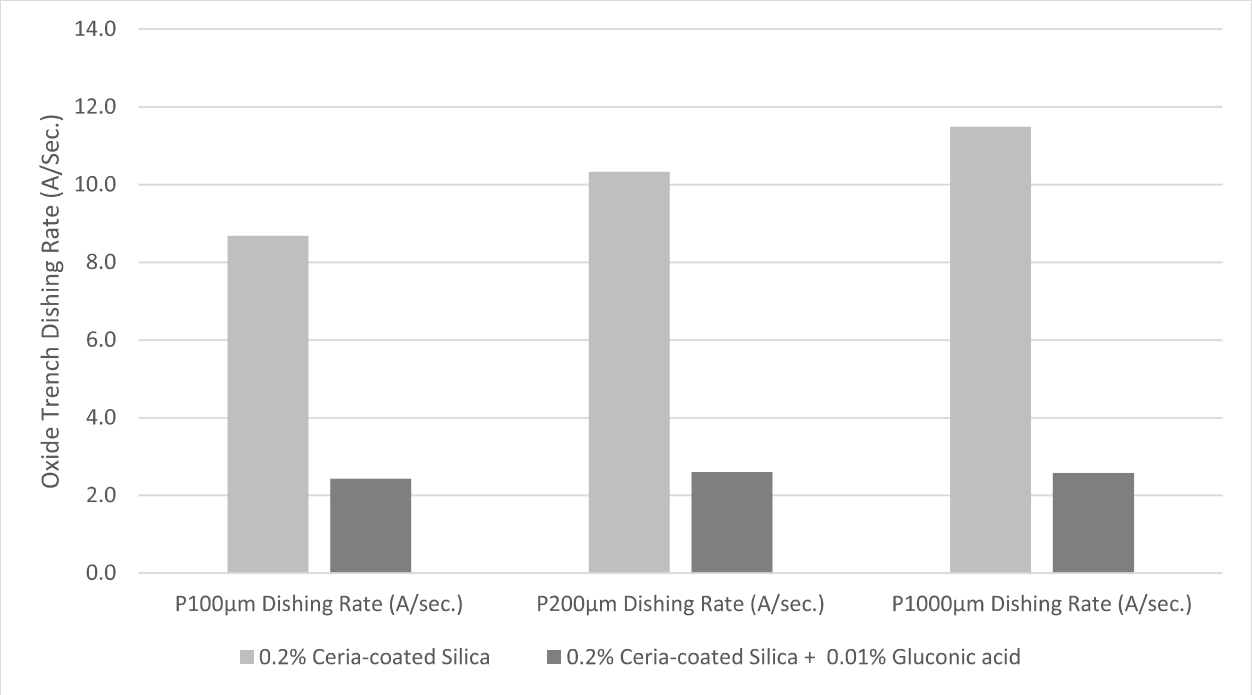
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Oxide Trench Dishing Rate (A/Sec.)
P100µm Dishing Rate (A/sec.)
P200µm Dishing Rate (A/sec.)
P1000µm Dishing Rate (A/sec.)
0.2% Ceria-coated Silica
0.2% Ceria-coated Silica + 0.01% Gluconic acid

Figure 2.

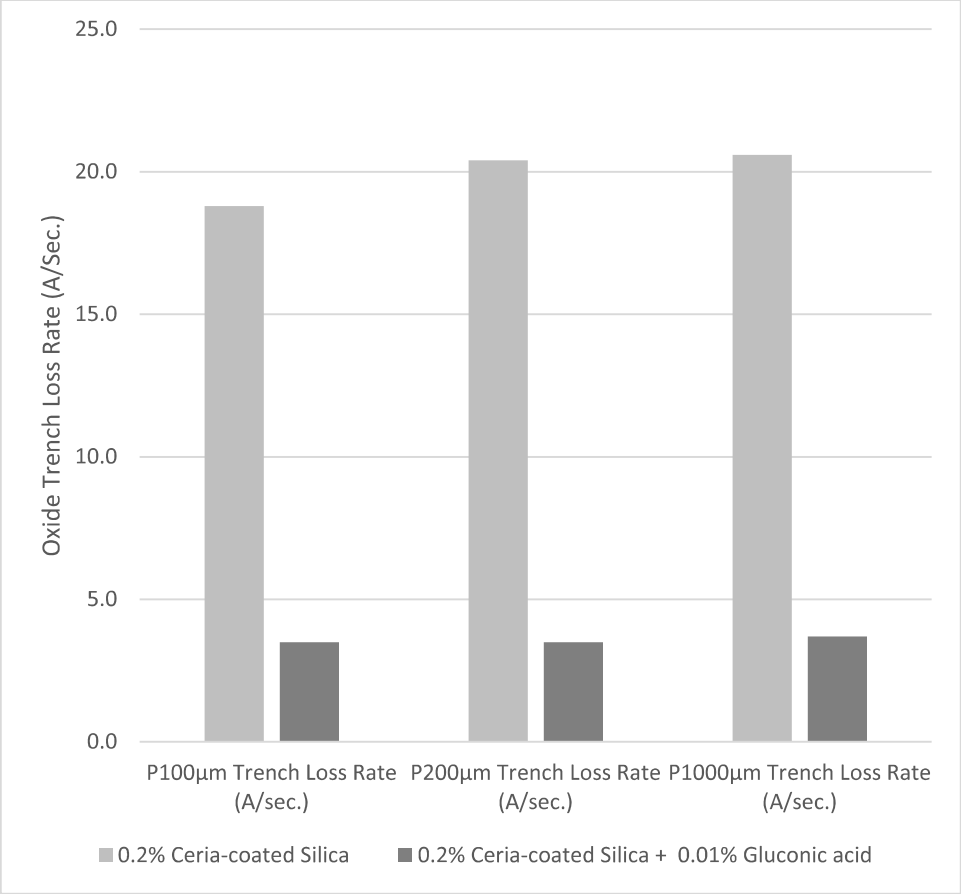
25.0
20.0
15.0
10.0
5.0
0.0
Oxide Trench Loss Rate (A/Sec.)
P100µm Trench Loss Rate (A/sec.)
P200µm Trench Loss Rate (A/sec.)
P1000µm Trench Loss Rate (A/sec.)
0.2% Ceria-coated Silica
0.2% Ceria-coated Silica + 0.01% Gluconic acid

Figure 3.

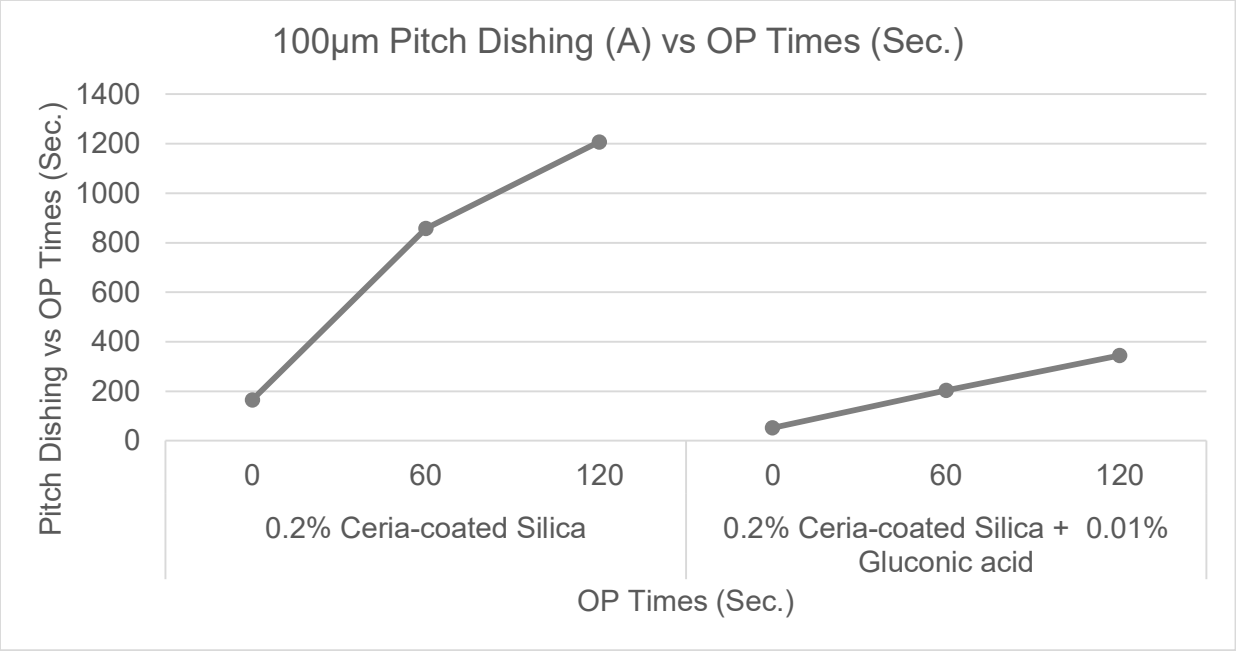
100μm Pitch Dishing (A) vs OP Times (Sec.)
Pitch Dishing vs OP Times (Sec.)
1400
1200
1000
800
600
400
200
0
0
60
120
0
60
120
0.2% Ceria-coated Silica
0.2% Ceria-coated Silica + 0.01% Gluconic acid
OP Times (Sec.)

Figure 4.

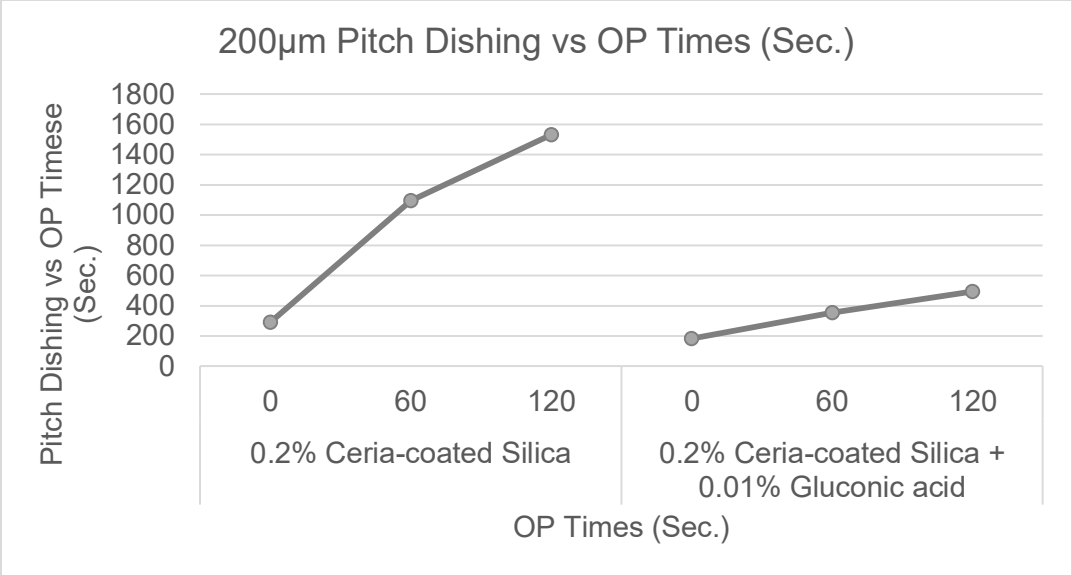
200μm Pitch Dishing vs OP Times (Sec.)
Pitch Dishing vs OP Timese (Sec.)
1800
1600
1400
1200
1000
800
600
400
200
0
0
60
120
0
60
120
0.2% Ceria-coated Silica
0.2% Ceria-coated Silica + 0.01% Gluconic acid
OP Times (Sec.)

Figure 5.

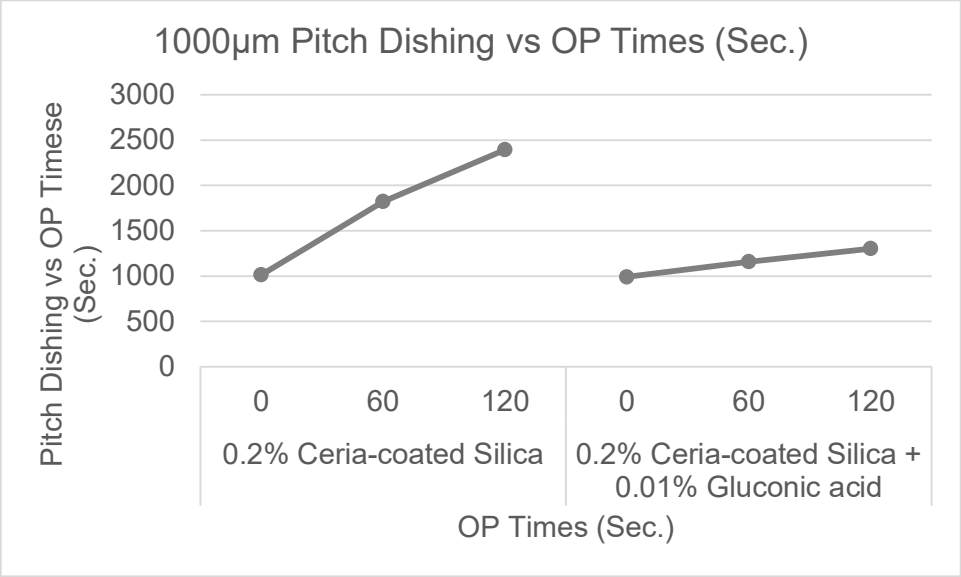
1000μm Pitch Dishing vs OP Times (Sec.)
Pitch Dishing vs OP Timese (Sec.)
3000
2500
2000
1500
1000
500
0
0
60
120
0
60
120
0.2% Ceria-coated Silica
0.2% Ceria-coated Silica + 0.01% Gluconic acid
OP Times (Sec.)

Figure 6.

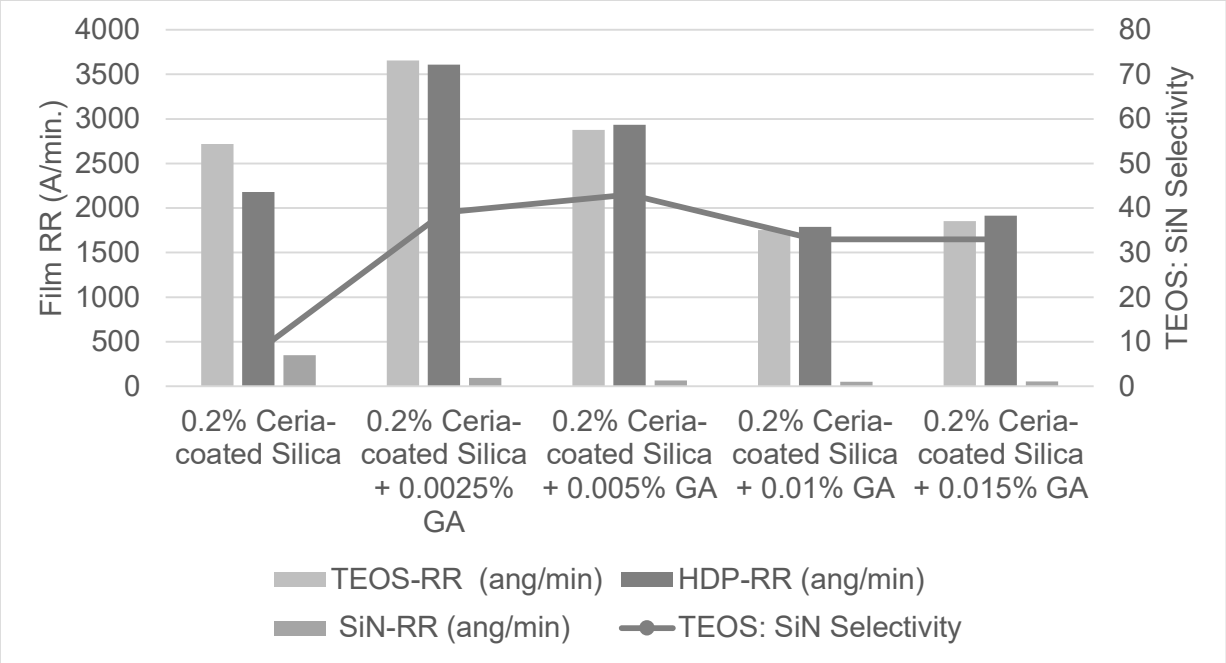
4000
3500
3000
2500
2000
1500
1000
500
0
Film RR (A/min.)
80
70
60
50
40
30
20
10
0
TEOS: SiN Selectivity
0.2% Ceria-coated Silica
0.2% Ceria-coated Silica + 0.0025% GA
0.2% Ceria-coated Silica + 0.005% GA
0.2% Ceria-coated Silica + 0.01% GA
0.2% Ceria-coated Silica + 0.015% GA
TEOS-RR (ang/min)
HDP-RR (ang/min)
SiN-RR (ang/min)
TEOS: SiN Selectivity

Figure 7.

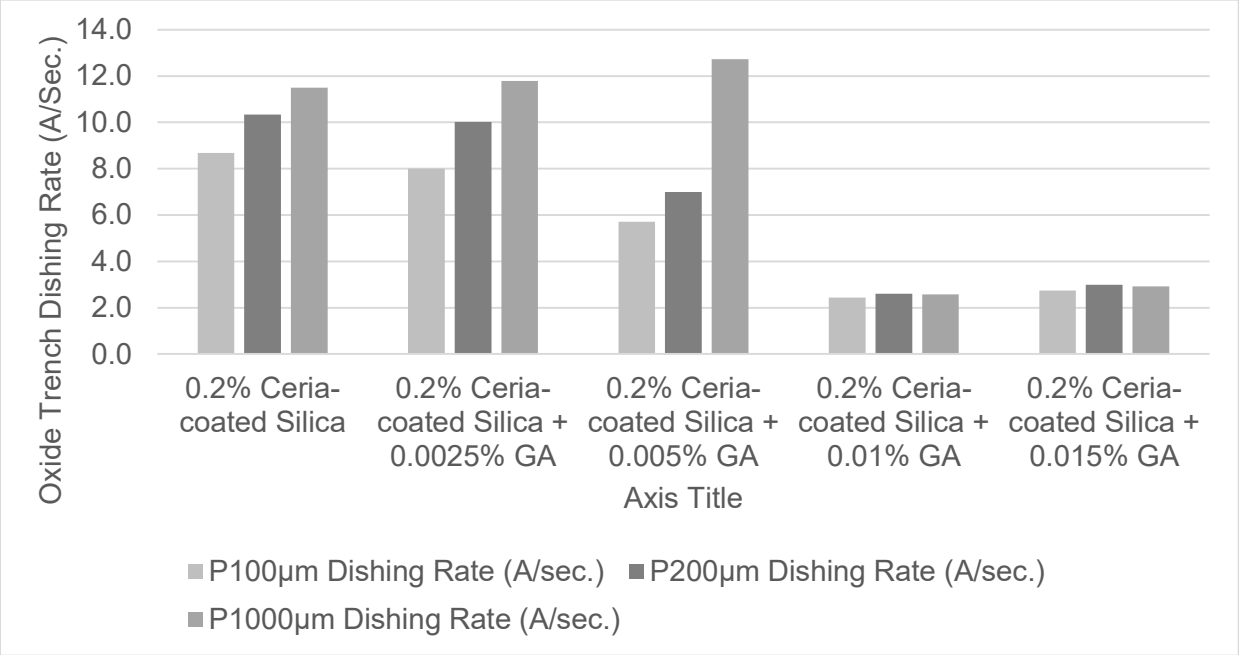
Oxide Trench Dishing Rate (A/Sec.)
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
0.2% Ceria-coated Silica
0.2% Ceria-coated Silica + 0.0025% GA
0.2% Ceria-coated Silica + 0.005% GA
0.2% Ceria-coated Silica + 0.01% GA
0.2% Ceria-coated Silica + 0.015% GA
Axis Title
P100µm Dishing Rate (A/sec.)
P200µm Dishing Rate (A/sec.)
P1000µm Dishing Rate (A/sec.)

Figure 8.

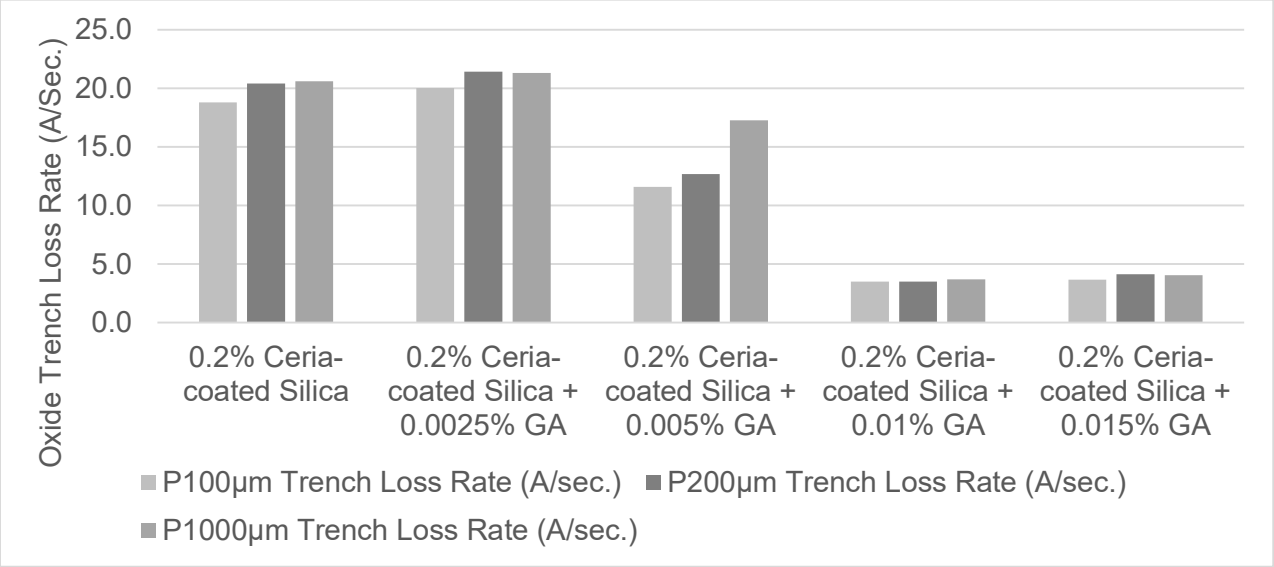
Oxide Trench Loss Rate (A/Sec.)
25.0
20.0
15.0
10.0
5.0
0.0
0.2% Ceria-coated Silica
0.2% Ceria-coated Silica + 0.0025% GA
0.2% Ceria-coated Silica + 0.005% GA
0.2% Ceria-coated Silica + 0.01% GA
0.2% Ceria-coated Silica + 0.015% GA
P100µm Trench Loss Rate (A/sec.)
P200µm Trench Loss Rate (A/sec.)
P1000µm Trench Loss Rate (A/sec.)

Figure 9.

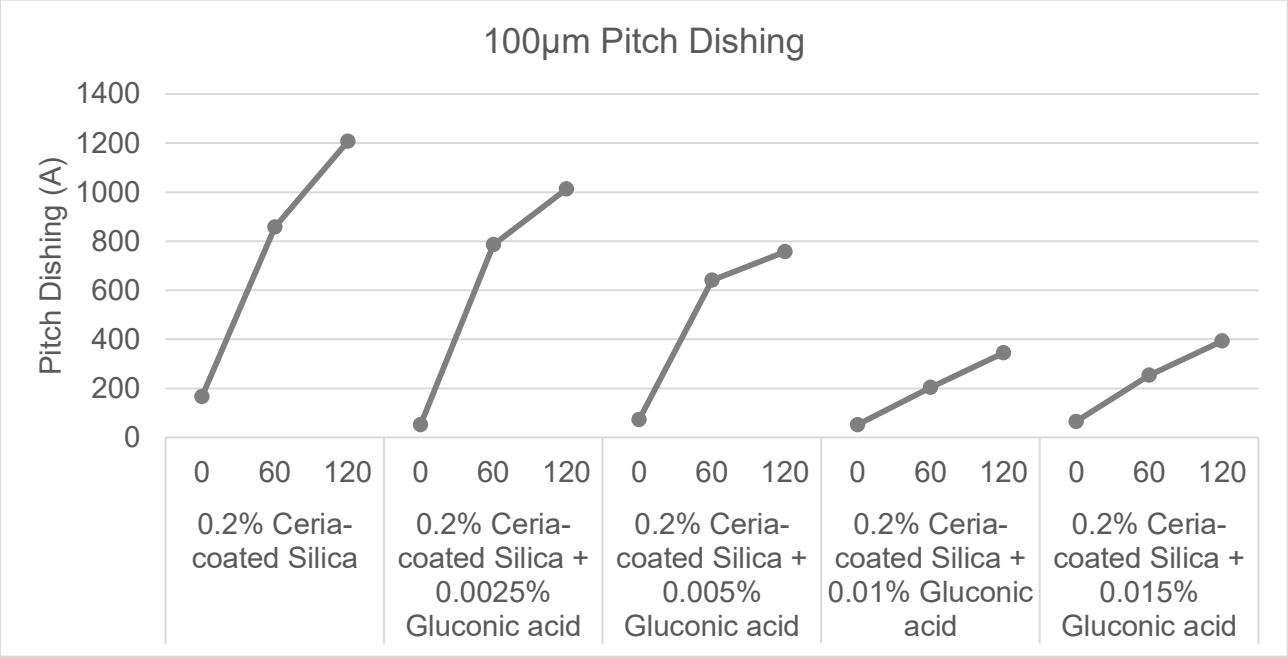
100µm Pitch Dishing
Pitch Dishing (A)
1400
1200
1000
800
600
400
200
0
0 60 120
0.2% Ceria-coated Silica
0 60 120
0.2% Ceria-coated Silica + 0.0025% Gluconic acid
0 60 120
0.2% Ceria-coated Silica + 0.005% Gluconic acid
0 60 120
0.2% Ceria-coated Silica + 0.01% Gluconic acid
0 60 120
0.2% Ceria-coated Silica + 0.015% Gluconic acid

Figure 10.

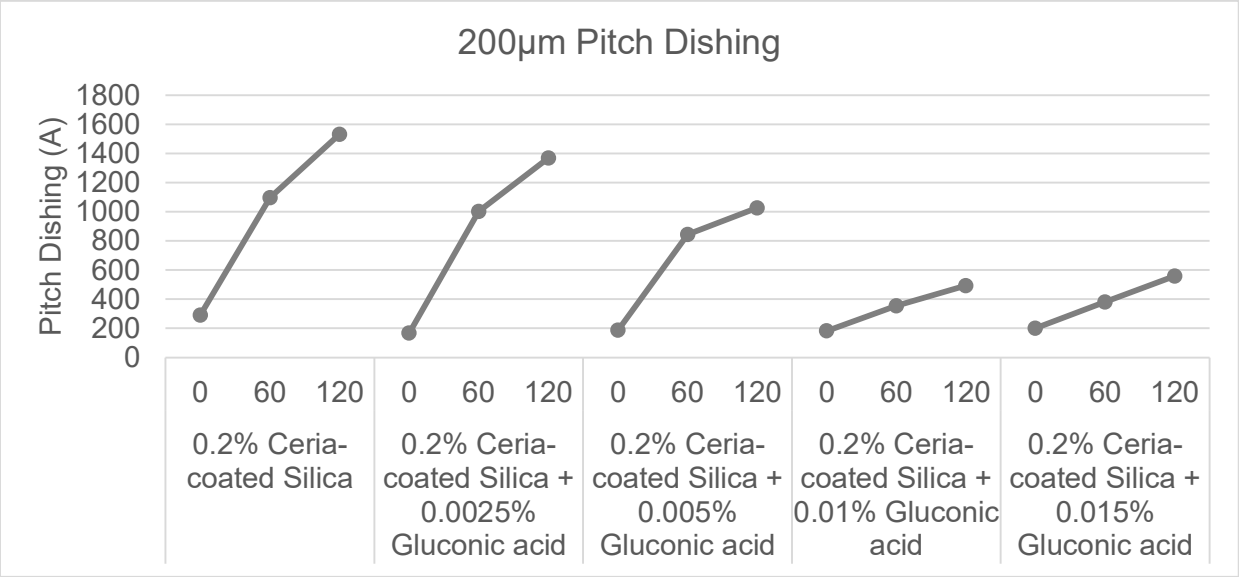
200µm Pitch Dishing
Pitch Dishing (A)
1800
1600
1400
1200
1000
800
600
400
200
0
0 60 120
0.2% Ceria-coated Silica
0.2% Ceria-coated Silica + 0.0025% Gluconic acid
0.2% Ceria-coated Silica + 0.005% Gluconic acid
0.2% Ceria-coated Silica + 0.01% Gluconic acid
0.2% Ceria-coated Silica + 0.015% Gluconic acid

Figure 11.

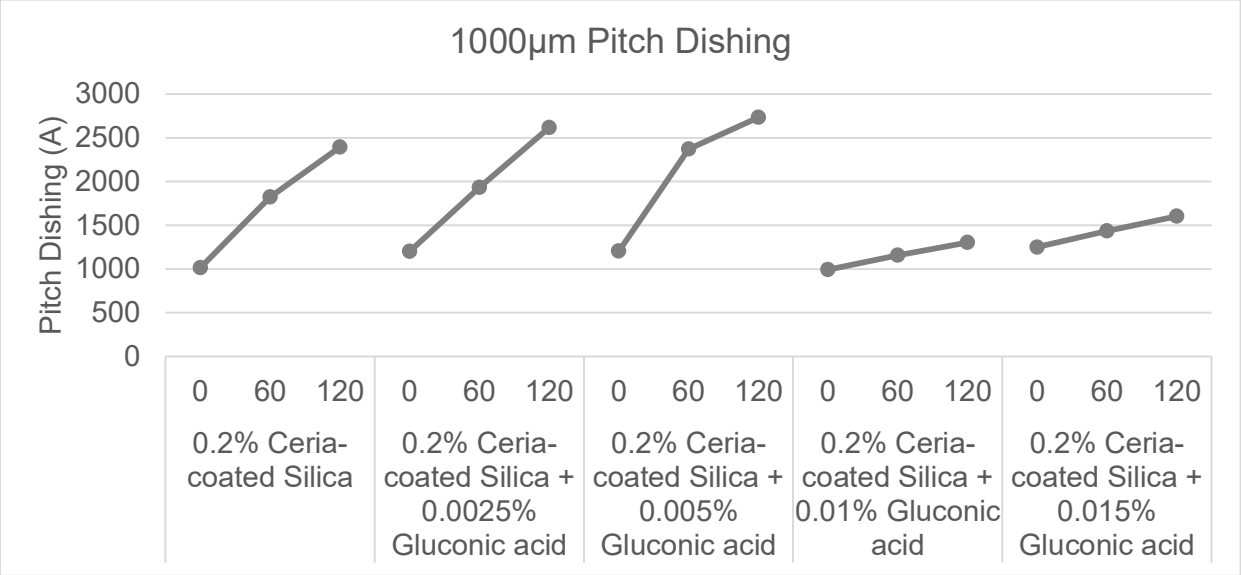
1000µm Pitch Dishing
Pitch Dishing (A)
3000
2500
2000
1500
1000
500
0
0 60 120
0.2% Ceria-coated Silica
0 60 120
0.2% Ceria-coated Silica + 0.0025% Gluconic acid
0 60 120
0.2% Ceria-coated Silica + 0.005% Gluconic acid
0 60 120
0.2% Ceria-coated Silica + 0.01% Gluconic acid
0 60 120
0.2% Ceria-coated Silica + 0.015% Gluconic acid

Figure 12.

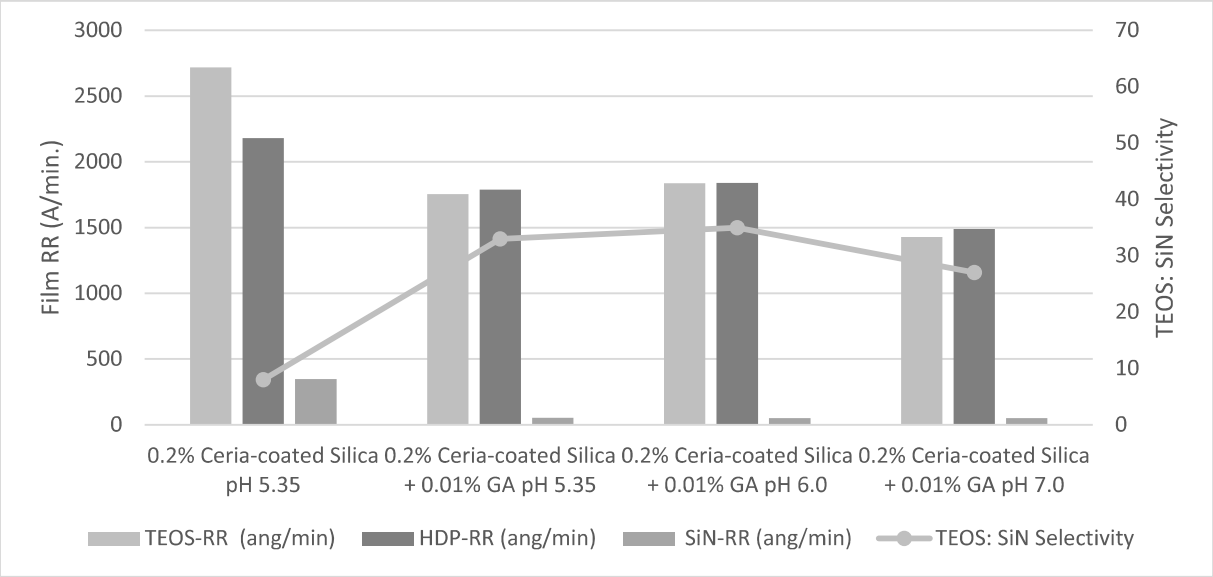
3000
2500
2000
1500
1000
500
0
Film RR (A/min.)
70
60
50
40
30
20
10
0
TEOS: SiN Selectivity
0.2% Ceria-coated Silica pH 5.35
0.2% Ceria-coated Silica + 0.01% GA pH 5.35
0.2% Ceria-coated Silica + 0.01% GA pH 6.0
0.2% Ceria-coated Silica + 0.01% GA pH 7.0
TEOS-RR (ang/min)
HDP-RR (ang/min)
SiN-RR (ang/min)
TEOS: SiN Selectivity

Figure 13.

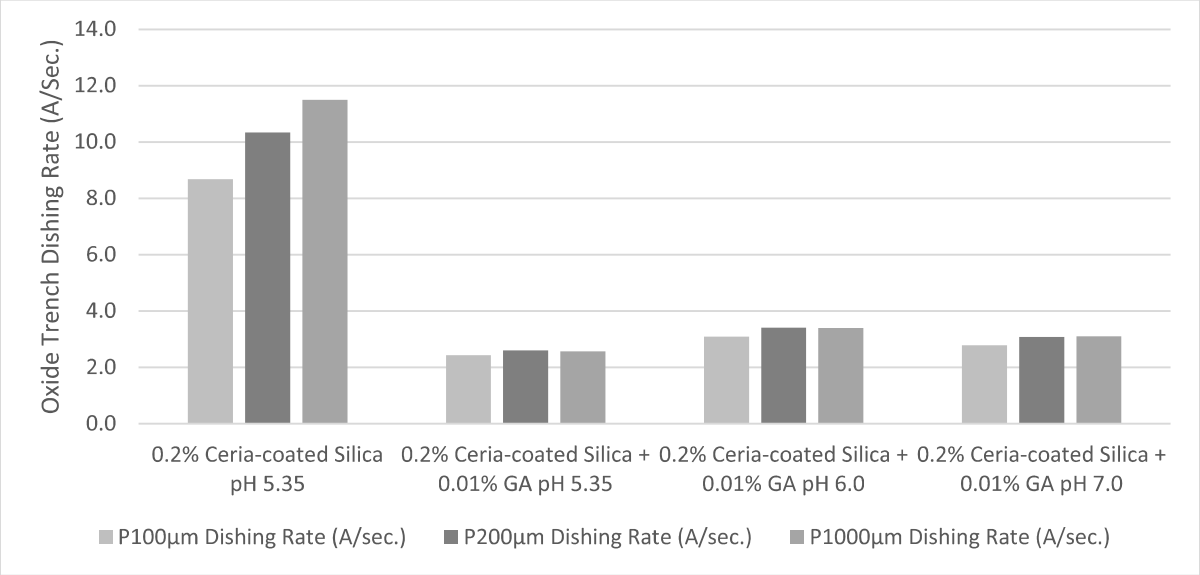
Oxide Trench Dishing Rate (A/Sec.)
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
0.2% Ceria-coated Silica pH 5.35
0.2% Ceria-coated Silica + 0.01% GA pH 5.35
0.2% Ceria-coated Silica + 0.01% GA pH 6.0
0.2% Ceria-coated Silica + 0.01% GA pH 7.0
P100µm Dishing Rate (A/sec.)
P200µm Dishing Rate (A/sec.)
P1000µm Dishing Rate (A/sec.)

Figure 14.

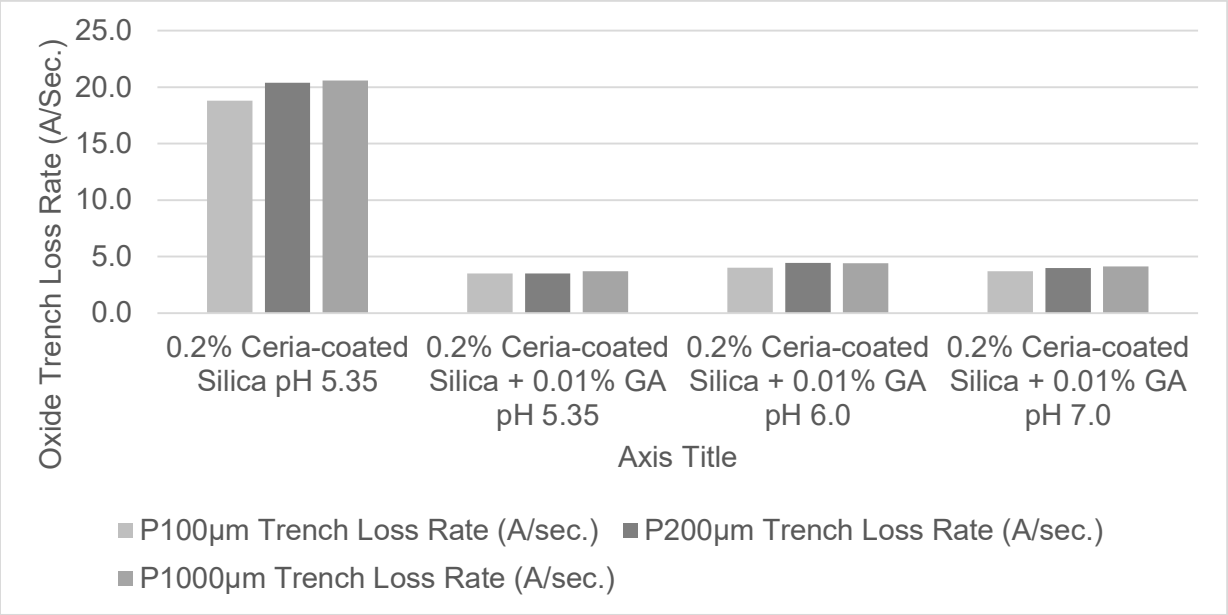
25.0
20.0
15.0
10.0
5.0
0.0
Oxide Trench Loss Rate (A/Sec.)
0.2% Ceria-coated Silica pH 5.35
0.2% Ceria-coated Silica + 0.01% GA pH 5.35
0.2% Ceria-coated Silica + 0.01% GA pH 6.0
0.2% Ceria-coated Silica + 0.01% GA pH 7.0
Axis Title
P100µm Trench Loss Rate (A/sec.)
P200µm Trench Loss Rate (A/sec.)
P1000µm Trench Loss Rate (A/sec.)

Figure 15.

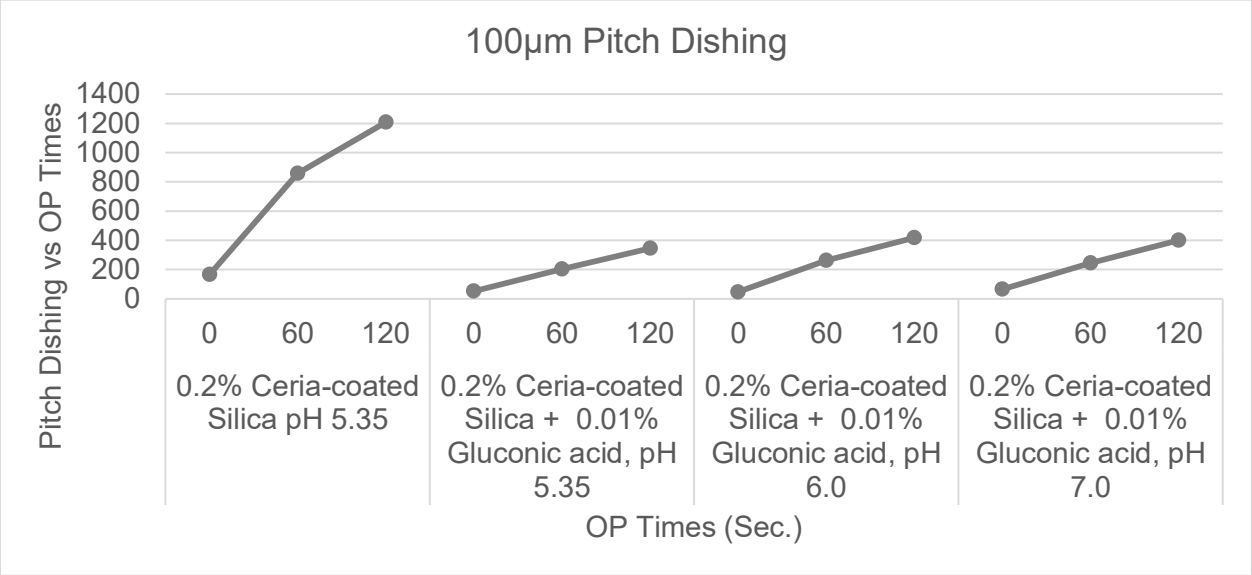
100µm Pitch Dishing
Pitch Dishing vs OP Times
1400
1200
1000
800
600
400
200
0
0
60
120
0.2% Ceria-coated Silica pH 5.35
0.2% Ceria-coated Silica + 0.01% Gluconic acid, pH 5.35
0.2% Ceria-coated Silica + 0.01% Gluconic acid, pH 6.0
0.2% Ceria-coated Silica + 0.01% Gluconic acid, pH 7.0
OP Times (Sec.)

Figure 16.

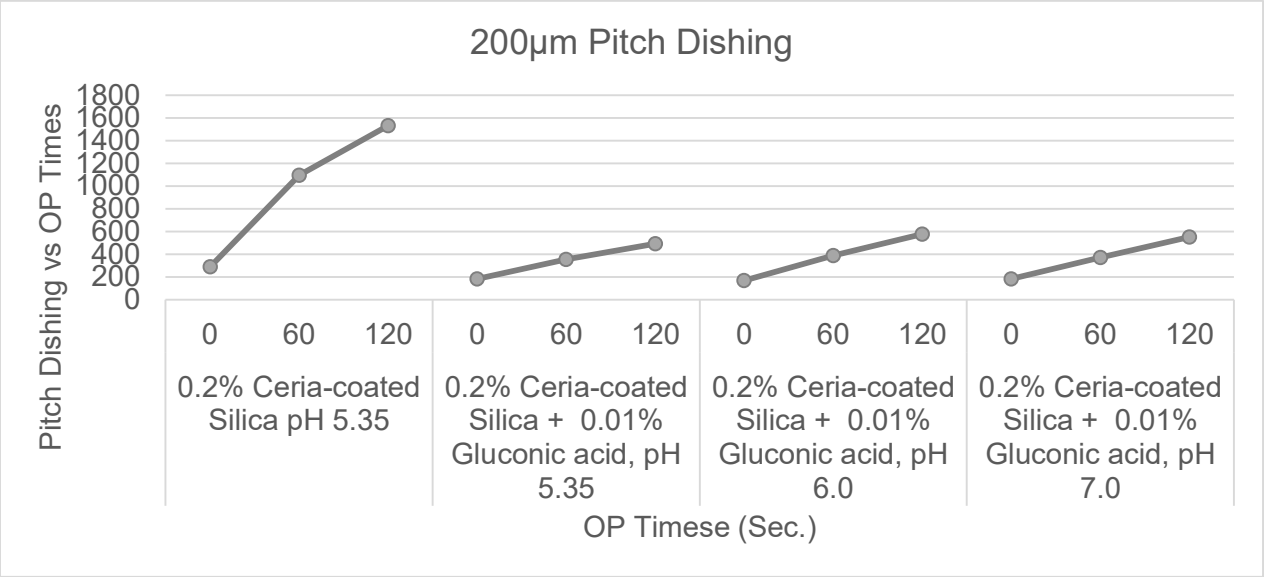
200µm Pitch Dishing
Pitch Dishing vs OP Times
1800
1600
1400
1200
1000
800
600
400
200
0
0
60
120
0.2% Ceria-coated Silica pH 5.35
0.2% Ceria-coated Silica + 0.01% Gluconic acid, pH 5.35
0.2% Ceria-coated Silica + 0.01% Gluconic acid, pH 6.0
0.2% Ceria-coated Silica + 0.01% Gluconic acid, pH 7.0
OP Timese (Sec.)

Figure 17.

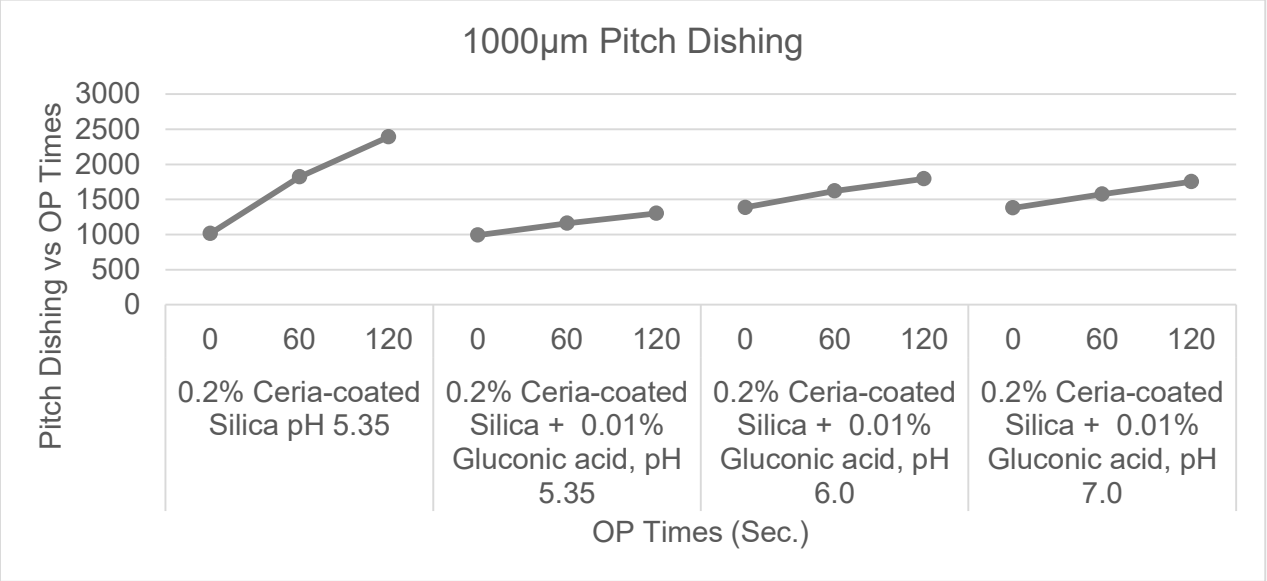
1000μm Pitch Dishing
Pitch Dishing vs OP Times
3000
2500
2000
1500
1000
500
0
0
60
120
0.2% Ceria-coated Silica pH 5.35
0.2% Ceria-coated Silica + 0.01% Gluconic acid, pH 5.35
0.2% Ceria-coated Silica + 0.01% Gluconic acid, pH 6.0
0.2% Ceria-coated Silica + 0.01% Gluconic acid, pH 7.0
OP Times (Sec.)

Figure 18.