Predictions - 2nd Generation Model



 Σ — Average contact area (0.15 µm alumina slurry = 62 nm)

Maximum contact area (0.15 μ m alumina slurry = 282 nm)

System	Ideal vdW (nN)	Force Prediction (Average C.A.) (nN)	Stand. Dev. (nN)	Force Prediction (Max. C.A.) (nN)	Stand. Dev. (nN)
Al ₂ O ₃ /Air/SiO ₂	15.2	10.8	1.3	108	3.3
Al ₂ O ₃ /Air/Cu	33.9	12.8	13.7	46.3	56.4
Al ₂ O ₃ /Air/W	35.3	15.0	18.3	56.1	68.2
Al ₂ O ₃ /H ₂ O/SiO ₂	1.3	0.9	0.1	3.3	0.1
Al ₂ O ₃ /H ₂ O/Cu	9.7	4.1	4.3	11.5	15.3
Al ₂ O ₃ /H ₂ O/W	10.3	4.4	5.3	16.6	21.4





Mounting of Alumina Particles





Front View



Mounting of Alumina Particles



Conclusion

1st Generation model

•Modeled particle adhesion for semi-ideal systems

- As a function of:
 - Surface morphology
 - Surface mechanical properties

2nd Generation model

•Expanded 1st generation model to better account or account for

- chemical and morphological heterogeneities
- compression and deformation of surface asperities
- bonding (covalent, hydrogen)
- particle settling (tilting and shifting)
- non-ideal geometries

Provides statistical information on particle adhesion





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