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Poster Session | F. From Microstructure to Properties: Mechanisms, Microstructure, Manufacturing**[PO-F2]Poster Session 2**

Symposium F

Wed. Oct 31, 2018 5:45 PM - 8:00 PM Poster Hall

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**[P2-46]Application of DLVO theory to predict dispersion stability of  $\text{ZrO}_2$  submicron particles in electrolyte solutions**

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In the manufacturing process of multi-layer ceramic capacitors (MLCC), electronic components often used in modern mobile phones, dispersion stability of  $\text{ZrO}_2$  submicron particles can be improved by altering the pH of electrolyte solution. In this study we used the DLVO theory to predict the energy barriers of interaction forces between two  $\text{ZrO}_2$  particles in various electrolyte solutions at different pH. The electrolyte solutions may be strong basic, weakly acidic, or strong acidic. The distance-dependent potentials of van der Waals force and electrical double layer force were calculated. The calculation results show that weakly acidic solution induces larger energy barrier between  $\text{ZrO}_2$  particles, because of stronger electrical double layer force. This larger energy barrier can prevent aggregation of  $\text{ZrO}_2$  particles and lead to dispersion stability.