

**TABLE 16** Comparisons of the Reduced ANN Models' Performance

Removed Inputs	$R_{\text{overall}}$	$MSE_{\text{train}}$	$MSE_{\text{validation}}$	$MSE_{\text{test}}$
Density	0.8165	0.0139	0.1127	0.0882
Refractive Index	0.8295	0.0020	0.6125	0.1453
Sound Velocity	0.8425	0.0127	0.1369	0.0369
Viscosity	0.6939	0.0578	0.1931	0.1629
Molecular Weight (MW)	0.7976	0.0317	0.0973	0.1132
Sound Velocity & MW	0.8416	0.0053	0.0740	0.0903
Refractive Index & MW	0.8321	0.0084	0.0847	0.0905
Density & MW	0.7231	0.0058	0.1476	0.1427
Density & Sound Velocity	0.8871	0.0105	0.0661	0.0532
Density & Refractive Index	0.6270	0.0367	0.2419	0.1563
Density & Viscosity	0.8141	0.0038	0.1202	0.0782
Refractive Index & Sound Velocity	0.8922	0.0088	0.0295	0.0789
Refractive Index & Viscosity	0.6970	0.0028	0.1146	0.1953
Sound Velocity & Viscosity	0.7965	0.0080	0.1086	0.1048