

Chemistry in Molecular Approaches to Silicon-Based Materials

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Silicon is the most widely used semiconductor. Silicon-based materials are at the heart of the modern microelectronic devices. In addition, silicon oxide has been used extensively as optical materials. Our research group has conducted fundamental studies related to the formation of Si-based microelectronic materials. Novel metal-Si bonded complexes have been prepared and characterized. Their reactivities have been investigated in order to provide an understanding of mechanistic pathways in the formation of microelectronic materials. Our research group has also developed novel acid, base and metal sensors. Sol-gel approaches are used to give porous silicon oxide materials containing functional groups as optical sensors. Our studies in these areas will be discussed. In addition, chemistry graduate program at the University of Tennessee, and graduate assistantships that provide support to all graduate chemistry students at UT will be introduced.