Supporting Information

Oxygen Transport and Incorporation in Pt/HfO_2 Stacks Deposited on Germanium and Silicon

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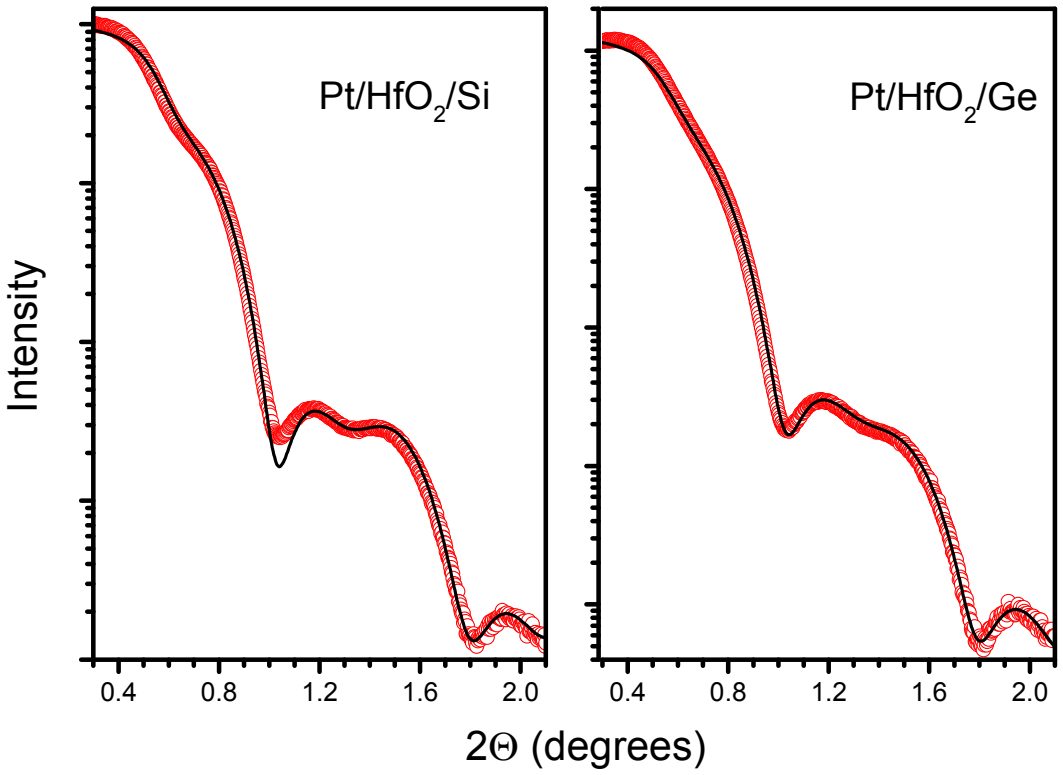

Figure S1. XRR data (symbols) and simulation (lines) from $Pt/HfO_2/Si$ and $Pt/HfO_2/Ge$ as-deposited samples. Parameters extracted from simulations are presented in Table S1.

Table S1. Parameters extracted from XRR simulations presented in Fig. S1. The density of Si and Ge were assumed to be 2.32 g/cm^3 and 5.08 g/cm^3, respectively.

	Film thickness (nm)			Density (g/cm^3)		
Samples	**Pt**	**HfO_2**	**Transition layer**	**Pt**	**HfO_2**	**Transition layer**
Pt/HfO_2/Si	5.0	4.9	0.7	22.68	10.00	6.47
Pt/HfO_2/Ge	5.0	5.1	0.3	22.28	10.00	7.95

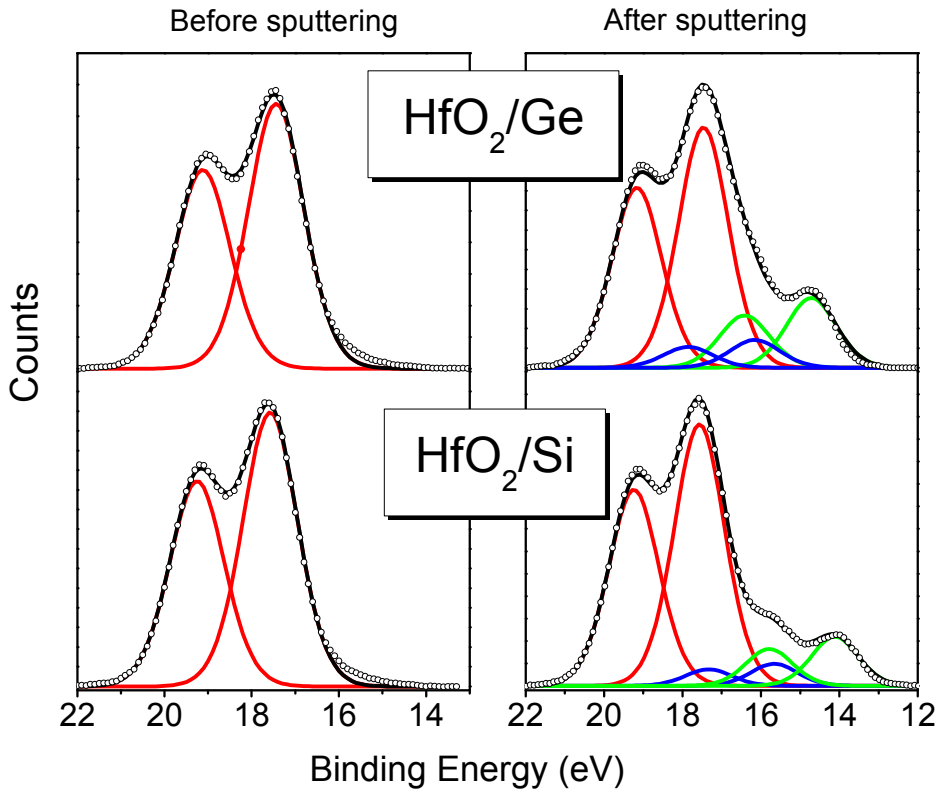

Figure S2. Hf *4f* regions of XPS spectra corresponding to HfO_2 films deposited on Ge and on Si. Spectra were collected from as-deposited samples (left side) and from the same samples following Ar sputtering (right side), which removed part of the HfO_2 layer. This procedure enabled the analysis of the HfO_2/semiconductor interface region. A Shirley background was subtracted from all spectra. A single doublet (red lines) was used to fit Hf *4f* signals from as deposited samples while two additional doublets (blue and green lines) were used to the fitting procedure of Ar sputtered samples. These additional components evidence the presence of Hf compounds other than HfO_2 (silicates in the case of Si, for example) close to the HfO_2/semiconductor interface. The formation of such compounds was already observed in similar samples prepared on Si (See for example Kirsch, P.D.; Kang, C.S.; Lozano, J.; Lee, J.C.; Ekerdt, J.G. Electrical and spectroscopic comparison of HfO_2/Si interfaces on nitride and un-nitrided Si(100). *J. of Appl. Phys.* **2002**, 91, 4353-4363.)