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# Erratum: *Ab initio* lattice dynamics and thermodynamics of $RuO_2(110)$ surfaces [Phys. Rev. B 81, 081405(R) (2010)]

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It has been brought to our attention that there is a potential misunderstanding concerning the implications of our results for surface phase diagrams. In our study we focus on a very accurate determination of the vibrational contribution to the free energy which is of direct relevance for quantitative determination of surface thermodynamic properties and surface phase diagrams.

In contrast, the *ab initio* thermodynamic treatment for catalytic processes as presented in Ref. 1 has been concentrating on a qualitative description of surface phase diagrams as function of given gas-phase conditions. In that context an approximate treatment of the vibrational free energy part is sufficient as long as it is small. For $RuO_2$ this contribution has been estimated in the past based on a simple Einstein model and found to be small indeed. This has been fully confirmed by our recent *ab initio* results. In our paper, we claimed that the change of the surface force constants necessary to get agreement with our *ab initio* calculations are at the limit covered in Ref. 2. However, this claim was based on an error in Ref. 1 (see Erratum[2]) which unfortunately escaped our attention. While in $RuO_2$ the vibrational part is small, the magnitude of this contribution nevertheless has to be checked for every individual system based on *ab initio* calculations.

We thank Karsten Reuter and Matthias Scheffler for pointing out the Erratum[2] to us as well as bringing the possible misunderstanding to our attention. Our conclusions concerning the stability of the $(1\times1)$ and $(1\times2)$ structures remain valid to their full extent.

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[1] K. Reuter and M. Scheffler, Phys. Rev. B **65**, 035406 (2001).

[2] K. Reuter and M. Scheffler, Phys. Rev. B **75**, 049901(E) (2007).