The Sabatier Principle Illustrated by Catalytic H2O2 Decomposition on Metal Surfaces -
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Heterogeneous catalysis is important in today's industry. Hence, it is imperative to introduce students to this field and its
tools. A new way of introducing one of these tools, the Sabatier principle, via a laboratory exercise is presented. A volcano
plot is constructed for the well-known heterogeneous H2O2 catalytic decomposition reaction on various metal foils. The
activity per catalyst surface area versus the computationally calculated binding energy of OH groups on the catalysts is
plotted. The OH group is identified as the only surface intermediate in an intuitive reaction mechanism, and hence, it is the
relevant reactivity parameter. From the calculated binding energies and the reaction mechanism, the volcano peak
position is inferred. This work is relevant to introductory levels of chemistry in advanced high school classes and initial
levels of university.

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