fraction at the critical charge transfer is 0.32±0.03, compared to the calculated value of 0.29. It is also less than the maximum possible place-exchange fraction of 0.33.

To summarize the course of reaction steps just discussed, the following model of surface oxidation can be deduced by assuming an ideal (\(\sqrt{3} \times \sqrt{3}\))R30\(^\circ\) structure upon completion of a monolayer oxidation. Note that the coefficients in the equations are not simple stoichiometric ratios of the chemical reactions but indicate the fractional coverage by the platinum species.

\[
\begin{align*}
Pt + \frac{1}{3} H_2O & \rightarrow \frac{2}{3} Pt + \frac{1}{3} PtOH + \frac{1}{3} H^+ + \frac{1}{3} e^- \\
\frac{2}{3} Pt + \frac{1}{3} PtOH + \frac{2}{3} H_2O & \rightarrow \frac{2}{3} PtOH + \frac{1}{3} Pt + \frac{1}{3} e^- \\
\frac{2}{3} PtOH + \frac{1}{3} Pt + \frac{1}{3} PtO & \rightarrow \frac{2}{3} PtO + \frac{1}{3} Pt + \frac{1}{3} PtOH + \frac{1}{3} e^- \\
\end{align*}
\]

Note that OPt represents a place-exchanged PtO. The first and second steps occurred abruptly corresponding to peaks I and II in the voltammogram, respectively, while the last step occurs continuously over a wide potential range corresponding to the slow and continuous rise of the anodic current.

**Conclusions**

In this article we have reviewed elementary aspects of the synchrotron-based x-ray-scattering technique for the investigation of the structure of electrochemical interfaces and some of its preliminary applications for the investigation of "buried" liquid/solid interfaces. We have shown its capability for providing detailed structural information on liquid/solid interfaces. We expect that, as the operation of the high-energy synchrotron sources advances, liquid/solid interface studies will also advance closer to the maturity level of current UHV surface science and beyond.

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**References**