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Using Brønsted-Evans-Polanyi relations to predict electrode potential-dependent activation energies

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HIGHLIGHTS

- Heyrovsky-like mechanisms are preferred for O-H and N-H formation
- Tafel-like mechanisms are generally preferred for C-H bond formation
- BEP relationships hold reasonably well for X-H (X=O, N, C) bond formations at constant voltage
- BEP relationships differ among O-H, N-H, and C-H formations

GRAPHICAL ABSTRACT