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NAD(P)H Oxidase Stability at Gas-Liquid Interfaces

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Abstract

Enzymatic oxidation is currently receiving great interest as a tool in synthetic organic chemistry. Several reactions are of interest, including enzyme-catalyzed alcohol oxidation, where the regeneration of the cofactor $NAD(P)^+$ is very important in order to ensure economic sustainability[1]. In this case, NAD(P)H oxidase (NOX, EC1.6.3.1) can be used to oxidize NAD(P)H for the *in-situ* regeneration of $NAD(P)^+$ while oxygen is supplied as the oxidant. Oxygen in air, which is economic and readily available, is generally considered as the most suitable oxidant for such processes, sparging bubbles into the reaction system, thereby creating a gas-liquid interface. Nevertheless, NOX stability at such a gas-liquid interface is poorly understood, while still of great importance to effective operation.

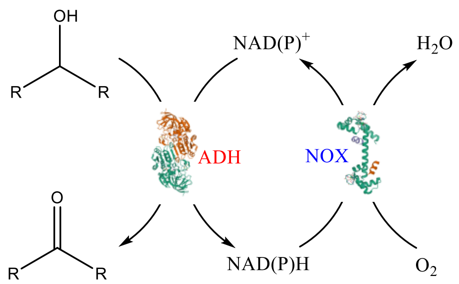

Figure 1 Enzymatic cascade catalysis of alcohol oxidation with alcohol dehydrogenase (ADH) and *in-situ* $NAD(P)^+$ regeneration with NAD(P)H oxidase (NOX).

In this presentation, results will be shown from the incubation of NOX under varying reactor conditions, including different amounts of gas-liquid interface. Ultimately, such data can form the basis to improve gas-liquid contacting in order to allow both effective kinetics and simultaneously an enzyme with good stability.

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Reference

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