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Biocatalytic Nitro Reduction: From Hit to Process

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PURPOSE OF THE ABSTRACT

Reduction of nitroaromatic compounds to their corresponding amines is conventionally performed using well-established chemocatalytic methods. However, lack of sufficient activity or chemoselectivity can sometimes limit the effectiveness of those methods. At Johnson Matthey (JM), we have recently developed a biocatalytic approach for the reduction of nitroaromatics combining a nitroreductase (NR) enzyme and vanadium. This technology has shown to overcome a common limitation of NR-catalysed nitro reductions in progressing beyond the formation of the hydroxylamine intermediate. This innovative approach has been demonstrated with a range of functionalised nitroaromatic compounds. By leveraging our diverse portfolio of NRs, we have successfully applied our synergistic NR/vanadium technology to several projects within short timelines.

Additionally, the biocatalytic approach developed by our group is complementary to JM's chemocatalytic solutions. Therefore, JM has a strong position in offering a complete solution for the reduction of nitroaromatics to assist customers and collaborators to rapidly develop cost-effective synthetic routes to aromatic amines.

FIGURES

FIGURE 1

FIGURE 2

KEYWORDS

nitro reduction | nitro reductases

BIBLIOGRAPHY

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