The Synthesis of Prilocaine from Toluene

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Prilocaine hydrochloride is a local anesthetic from the amide family. Commonly used in dental work as an injected topical anesthetic, prilocaine temporarily numbs and inhibits nerve endings in soft tissue for up to two hours, leading to a decrease in pain. The synthesis of prilocaine is a four step process which starts with a mono-nitration of toluene. The nitrated product is then reduced by catalytic hydrogenation to produce toluidine. O-toluidine hydrochloride is isolated by treating toluidine with acetic anhydride followed by an extraction for purification. The acetylated product was then mixed with 2-choloropropionyl chloride to produce the final prilocaine product. In an effort to make the reaction more environmentally friendly, diethyl ether was replaced by methoxycyclopentane in the mono-nitration of toluene.