



“Sustainable dialdehyde starch production process”

Context

Oxidation of starch to dialdehyde starch (DAS) yields a functionalized biopolymer that finds widespread application as cross-linking agent to improve wet strength of paper, as tanning agent in leather industry, to improve water resistance of materials, coatings, and glues, as active component in cosmetics and antimicrobials, as excipient in pharma or as additive in feed and food. Periodic acid is the benchmark oxidant that selectively oxidizes the vicinal diol with concomitant cleavage of the connecting bond to form 2 aldehyde moieties. Despite the efficiency and selectivity of this reaction, high cost of the oxidant and the complex regeneration procedure make the process industrially irrelevant. An innovative approach to avoid these limitations is described.

Technical Description

The current invention demonstrates that bis(acetoxy)iodobenzene, an organoiodine compound, is an equally selective oxidant which has the benefit of being easily recyclable.

Benefits

The current procedure is advantageous because of its

- equal selectivity as the benchmark periodate oxidation
- efficient regeneration of the oxidant under mild conditions
- more sustainable due to the lack of salt formation

Target

Functionalized biopolymer formation from polysaccharides

Further research/Extension

- Tuning degree of oxidation (DO) in view of specific applications
- Optimization of regeneration yield

Relevance

The invention allows efficient DAS production with subsequent regeneration of the organoiodine oxidant under mild conditions, without salt formation.

Our Reference:

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Dialdehyde starch, Oxidation, Regeneration

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Method to Modify Carbohydrates

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