Low-Temperature Polyolefin Iodination Method Using Extruder

KEYWORDS

Polyolefin Iodination
Low-temperature processing
Easy way modification
Sustainable polymers

PATENT

Title: Method of manufacturing a halogenated polyolefin

GB patent application

Priority date: 11/07/2024

LICENSING

Exclusive, non-exclusive licences and research collaborations

INVENTORS

UMONS

Mr. Olivier COULEMBIER

Mrs. Amna BEN AYED

Mrs. Juliette DELCORPS

PROBLEM

The invention addresses the challenge of efficiently iodinating polyolefins, like polyethylene (PE) and polypropylene (PP), at low temperatures while achieving a high iodine content by mass.

Traditional iodination methods for polyolefins have not been industrialized, and existing studies often require complex plasma processes without specifying precise iodination levels, resulting in low yields. Additionally, other halogenation processes (like chlorination and bromination) for polyolefins typically require high temperatures (200-250 °C), which risks polymer degradation and high energy costs.

SOLUTION

The invention proposes a novel iodination method using iodoform (CHI_3) as the iodine source and NaOH as a base, carried out in an extruder at a low temperature (under 110 °C) to reduce polymer degradation and energy consumption.

Key features of this process include a **reaction time of under two hours and an optimal iodine content of 23% by mass**. Advantages of this method include its **simplicity, energy efficiency, and rapid reaction time**, alongside a high iodination yield (in weight). Iodoform offers benefits over other iodine agents due to its stability, ease of handling, reduced toxicity, and effectiveness in producing high iodination levels.

This technology is particularly valuable for **polymer transformation industries**, **polyolefin manufacturers, recycling sectors**, and researchers focused on polymer modification and composite materials.

INNOVATION

- Low-Temperature process
- High Iodine Yield
- Iodoform Utilization
- Energy efficiency
- Rapid reaction time
- Reduced Toxicity

TECHNOLOGY STATUS

TRL 5

MARKETS

- **Automotive & Aeronotics**
- **Naval**
- **Electronics**
- **Sports & Leisure**
- **Construction**

Contact

Séverine Coppée
AVRE
+32 (0)65 37 30 56
severine.coppee@umons.ac.be

UMONS
Université de Mons