

Recovery Strategy for Carbon Dioxide and Solvents

Effective strategy for recovering carbon dioxide and solvents after delignification processes

Inventors at Georgia Tech have created a strategy for recovering solvents that aid in separating lignin prior to pulping processes. Multiple amines were found to separate lignin from lignocellulosic while still leaving residual cellulose suitable for pulping. Amines containing dissolved lignin were treated with carbon dioxide, leading to formation of the corresponding carbamates and precipitating lignin and the carbamate. The addition of water dissolves the carbamate while still leaving lignin as a solid. This results in the carbamate being precipitated from water upon the addition of alcohols.

Summary Bullets

- **High quality** - superior quality lignin produced that is sufficient for chemicals, pulp, and paper
- **Useful** - aids in isolating lignin and recovering and concentrating carbon dioxide

Solution Advantages

- **High quality** - superior quality lignin produced that is sufficient for chemicals, pulp, and paper
- **Useful** - aids in isolating lignin and recovering and concentrating carbon dioxide

Potential Commercial Applications

- Widely applicable
 - Pulp and paper industry
 - Chemical industry

Background and More Information

Delignification technology has been utilized for over thirty-five years. It is classified as the process of breaking down the chemical structure of lignin and rendering it soluble in liquids. Delignification uses alkali and oxygen to remove a large quantity of residual lignin from pulping processes. The discovery of the low solubility of lignin in carbamate solutions can be used to isolate lignin after separation from lignocelluloses. There is a growing need for a strategy that dually assists in isolating lignin and recovering and concentrating carbon dioxide.

Inventors

- Dr. Andreas Bommarius
Professor - School of Chemical and Biomolecular Engineering
- Dr. Matthew Realf
Professor and David Wang Sr. Fellow - Georgia Tech School of Chemical and Biomolecular Engineering
- Dr. Christopher Luetgen
Professor of the Practice and Associate Director - Renewable Bioproducts Institute - Georgia Tech School of Chemical & Biomolecular Engineering
- Dr. Thomas Kwok
Scientist

IP Status

:

Publications

, -

Images

Visit the Technology here:

[Recovery Strategy for Carbon Dioxide and Solvents](#)

<https://s3.sandbox.research.gatech.edu//index.php/print/pdf/node/3413>