

[評 価・安 全]

D-1

化学物質安全性データベースの開発

田辺和俊・松本高利（産業技術総合研究所）

Development of Chemical Safety Database

TANABE Kazutoshi, AIST

Recently effects of chemicals on global environment are serious matter, but reliable data on chemical safety are few and sparse. We are developing a chemical safety database system, which consists of a database subsystem which contains reliable safety data on numerous chemical substances, and a prediction subsystem which evaluates safety on known or unknown chemical substance by quantitative structure-activity relationship.

D-2

完全加溶媒分解 ES 処理によるセルロース系廃棄物の 有用ケミカルスへの変換

山田竜彦(独立行政法人森林総合研究所) 小野拓邦(東京大学農学生命科学研究科)

Recycling Utilization of Cellulosic Waste through Exhaustive Solvolysis for Preparing Useful Chemicals

YAMADA Tatsuhiko, Wood Res

Exhaustive solvolysis (ES) is a new solvolysis technique that converts lignocellulosic waste into useful chemical resources. Exhaustive degradation of cellulose is the key point of this technique. Cyclic carbonates are used as the ES-reagent. Cyclic carbonates accelerate the acid catalyzed solvolysis of cellulose, and rapidly lead cellulose to levulinic acid derivatives. Whole lignocellulose can be converted into useful chemicals without producing any useless residual fraction such as char, tar and humin.

D-3

レーザーを用いた綿布のハロゲンフリー漂白

大内秋比古,小幡 透,坂井 仁(産業技術総合研究所・グリーンプロセス研究ラボ)

Halogen-Free Laser Bleaching of Cotton Cloths

OUCHI Akihiko, AIST

Decoloration of water-insoluble natural colored compounds adsorbed or chemically bound on cotton cloths were conducted effectively by a selective KrF excimer laser-induced photolysis of the colored compounds in the presence of NaBH₄ aqueous Solutions.

D-4

消去可能インク

町田 茂,高山 暁,池田 成,小口雅之,田中 章,佐野健二(東芝 研究開発センター)

Decolorable Printing Inks

MACHIDA Shigeru, Toshiba

The decolorable printing ink consists of a colorless dye, a developer, and an erasing reagent. In the ink, the dye interacts with the developer to be colored and the erasing reagent is dispersed in a matrix material. The image drawn by the ink can be erased easily by heating or solvent treatment. By the process, the bonding between the dye and the developer is cleaved and the erasing reagent is activated at the same time. Subsequently, the released developer is absolutely trapped by the erasing reagent.

D-5

重回帰とニューラルネットアプローチによる 3次元構造情報からの化学物質の発ガン性予測

鈴木孝弘, 黒田泰史 (東工大・資源研)

Prediction of carcinogenicity of chemicals from their 3D structures using multiregression and neural network approaches

Bono Lucic, Nenad Trinajstic (The Rugjer Boskovic Institute, Croatia)

Multiple linear regression (MLR) and three-layer artificial neural network (ANN) modeling with back-propagation have been applied to develop quantitative structure-toxicity relationships. The training set contains 323 diverse chemicals and their carcinogenicity data

were obtained from the US National Toxicology Program. Two sets of descriptors, DRAGON and BCI Fingerprints, were used for the modeling. The ANN model with 25 kinds of DRAGON descriptors gave the best prediction performance for the test set of 185 compounds.

D-6

二酸化炭素排出量による生分解プラスチックの評価

北尾 修・伊藤 貴輝・温 慶茹・大友 順一郎・高橋 宏 (東京大学大学院工学系研究科)

Assessment of Biodegradable Plastics by amount of carbon dioxide emission

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Eng. Res. Inst., Sch. of Eng., the Univ. of Tokyo,

Although biodegradable plastics are designed as environmental friendly materials, no sufficient qualitative assessment has been done. We use only amount of carbon dioxide emission and estimate the effect to the environment about the biodegradable plastics. As the disposal method, we consider chemical recycling of the biodegradable plastics using enzyme by Matsumura et al. (Macromol. Rapid Comm., 21, 860-863 (2000)).

D-7

材料技術の知識の構造化

渡邊 英一^{1,2)}・北尾 修¹⁾・目崎 令司^{1,2)}・小川 哲司^{1,2)}・高野 香織^{1,2)}・安田 英典³⁾・

入江 幸江³⁾・竹脇 和也³⁾・矢野 吉則²⁾・山口 由岐夫¹⁾・小宮山 宏¹⁾

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Structure Knowledge Project in Nanotechnology Materials Program

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The potential of Nanotechnology is expected to displace major existing technologies, create new industries, and transform archetypal scientific models in the areas of energy, environment, communications, computing, medicine, and other materials related areas. With worldwide competition on nanotechnology (e.g. NNI (National Nanotechnology Initiative), 2000), Japan is going to reinforce the development in nanotechnology for materials. This presentation exhibits the grand design of "Structuring Knowledge Project" in "Nanotechnology Materials Program (NEDO, 2001)" planned by Japanese METI (Ministry of Economy and Trade Industry), which

has just started on fiscal year 2001.

D-8

ポリマー製造におけるプロセス工程に関する日欧間の比較

鳩山宜伸、坂村博康、安井 至 (東京大学 生産技術研究所)

A Comparison in Japan and Europe on Process for Polymer Production

HATOYAMA, Yoshinobu (University of Tokyo)

Life-Cycle Inventory (LCI) databases on typical polymers are constructed in Japan and Europe. We have done a comparison about the total amount of hydrocarbon fuel and energy consumption on process for polymer production in Japan and Europe. Further, the total amount of crude oil and NGL based on the differences of energy intensity of electric power also have been compared.

D-9

マイクロバブル発生装置とその応用

福田直之 [協和エンジニアリング(株) 協和発酵グループ]

Microbubble Generator and Application

FUKUDA Naoyuki, (KYOWA Engineering)

We have invented the generator of the super-minimized microbubble in the world. The average diameters of microbubble are approximately 10 μ m. The characteristic of microbubble has its high efficiency of dissolved oxygen in water and these retention times are very long as microbubble in water or solution. These multiple applications of our microbubble are shown below. (1) floatation and separation (2) gas/liquid reaction and mixing (3) liquid/liquid reaction and mixing (4) culture of fish or shellfish ,etc.

D-10

水性リサイクル塗装システム

上野山 一夫 (日本ペイント株式会社)

Water-borne Recycling Paint System

UENOYAMA, K (Nippon Paint Co., Ltd., Osaka)

The water-borne recycling paint system is a system to collect paint dusts at a spraying booth that do not form the coating on an object and to separate them from the water by means of an ultra-filtration device for recycling. This system is very effective device for saving natural resources due to recycling of paint dusts having been treated as a industrial waste and has already been commercially available.

D-11

グリーンケミストリーを指向した製造プロセスの開発

石原正巳、佐野淳典、小林榮 (和光純薬工業株式会社 化成品研究所)

Development of Green Manufacturing Processes for Pharmaceuticals

Ishihara Masami, WAKO Chemical

We have developed green processes for the preparation of pemirolast (antiallergy agent) and felbinac (antiinflammatory agent). In the synthesis of pemirolast, we could avoid the generation of toxic HN_3 by using the new key intermediate. In the synthesis of felbinac, we could adopt a catalytic reaction and reduce the synthetic steps. These processes are superior to the corresponding previous processes in terms of atom economies.

D-12

非平衡プラズマを利用した VOC 分解における 酸化バナジウム触媒との相乗効果

安藤 誠、関口 秀俊、鈴木 正昭 (東京工業大学大学院理工学研究科)

Synergic Effects of V_2O_5 Catalyst on Non-Thermal Plasma Decomposition of Volatile Organic Compounds

ANDO, M., SEKIGUCHI, H., and SUZUKI, M. (Tokyo Institute of Technology)

The treatment of volatile organic compounds (VOC) was studied using non-thermal plasma. In this research, the decomposition of benzene as typical VOC was performed using dielectric barrier discharge. The experiment was carried out with the catalyst of V_2O_5 . The results showed that the conversion was improved with the catalyst under the plasma conditions and the synergic effect was observed.

D-13

安心をもたらす科学情報と安心指標

大井典子、鈴木正昭（東京工業大学 院・理工）

Scientific Information giving “Anshin” and “Anshin” Index

Ooi, N. and Suzuki, M. (Tokyo Institute of Technology)

In order to develop how to give people “Anshin” in the risk communication process of chemical substances, we carry out a questionnaire survey and review indicator point of LCA methods. These results are compared with the information people really need and the methodology of “Anshin Index” is proposed. Here, “Anshin” is used to express the uneasiness-free feeling.

D-14

従来はんだと無鉛はんだにおける環境インパクト分析

原 美永子，松村 寛一郎，安井 至（東京大学 生産技術研究所）

Environmental impact analysis of lead solder and lead-free solder

HARA Mieko (University of Tokyo)

It is necessary to develop a new method for the interpretation of Life Cycle Assessment (LCA) inventory data, if LCA is used for decision making. Human toxicity of lead via exposure through the air by inhalation of particles, which are generated from disposal of electrical appliance, is estimated at a maximum of blood lead concentration 10^{-3} $\mu\text{g}/\text{dl}$ by simulation. The results suggest that substitution by lead free solder for lead solder causes increase of risks in other category such as energy consumption, but reduction of risks in human toxicity is rather small.