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Division of Science

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Major

Organic chemistry, Organic photochemistry, Solid-state organic chemistry

#### ■ Research topics

## Orientation control of molecules through intermolecular interactions

### Keywords

Cation- $\pi$  interaction, Solid-state photochemistry

### Contents

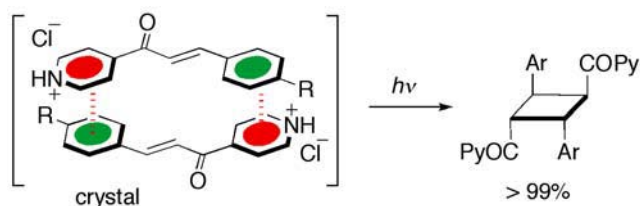
#### ■ Overview (background, goal, detail)

It is still difficult to control the orientation of molecules in crystal.

We have found that the orientation of some molecules that have cations can be controlled through cation- $\pi$  interactions in solid-state. Reorientation of molecules also possible by the reaction of gas-solid reactions.

#### ■ Process, case study

Recrystallization of 4-azachalcone hydrochlorides produced head-to-tail type crystals, irradiation of which afforded cyclobutanes in high yields and stereoselectivities.



#### ■ Potential (applications, future goals)

Application to development of new materials or some sensors.

### Publications

1. S. Yamada, Y. Tokugawa, "Cation- $\pi$  Controlled Solid-State Photodimerization of 4-Azachalcones", *J. Am. Chem. Soc.* 2009, 131, 2098-2099.
2. S. Yamada, N. Uematsu, K. Yamashita, "Role of Cation- $\pi$  Interactions in the Photodimerization of *trans*-4-Styrylpyridines", *J. Am. Chem. Soc.* 2007, 129, 12100-12101.

### Potential of social/industrial contribution

#### ■ Joint research

X-ray structural analysis of organic crystals

