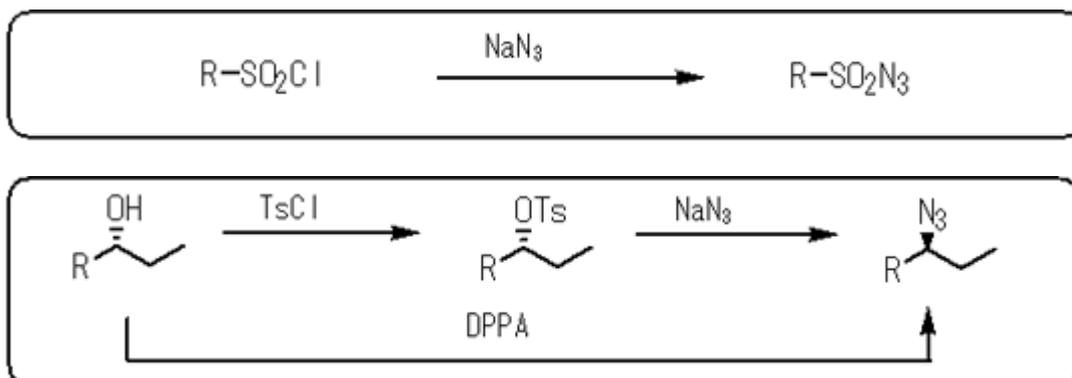


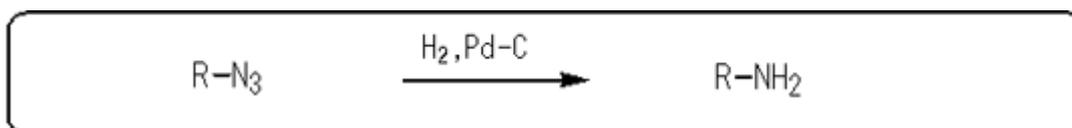
## Custom Manufacturing

We produce industrial and pharmaceutical chemicals from R&D scale to a large amount, on assignments. Especially as for pharmaceutical intermediates, we undertake to manufacture them under a strict quality control system, applying our expert technology, by utilizing facilities suited GMP requirement. Please contact us for your request.

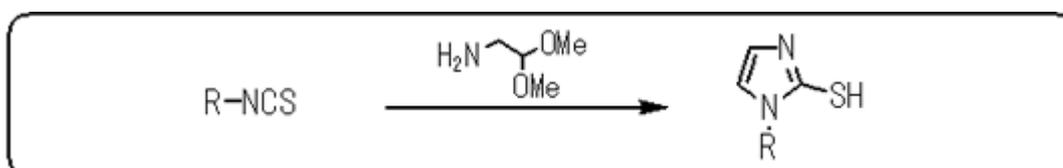
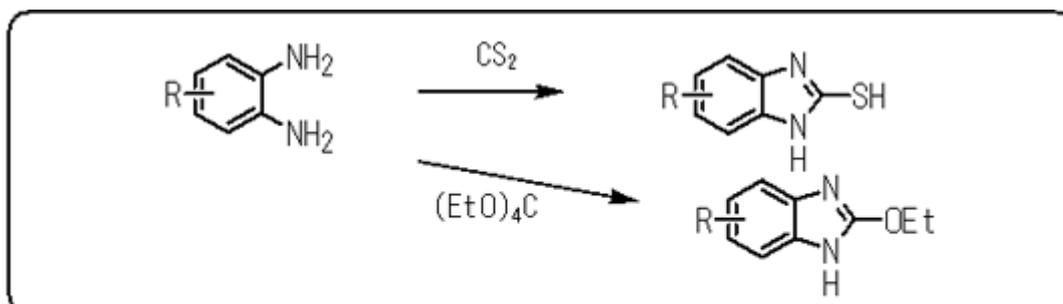
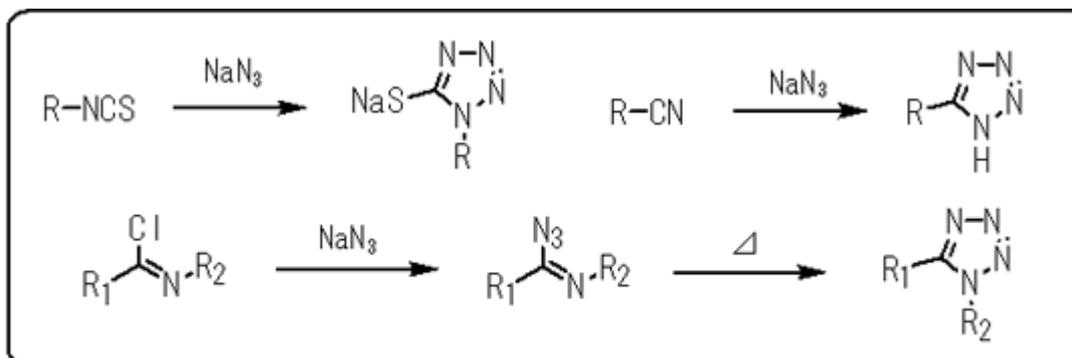
### Azides



### Amination

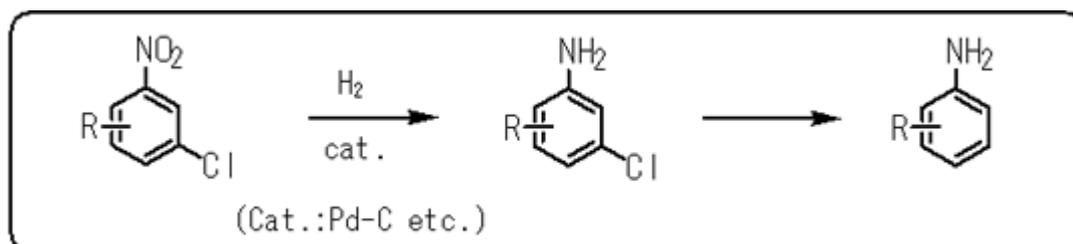


### Heterocycles

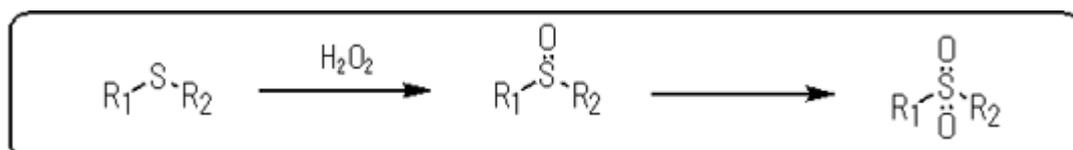


# Fine Chemicals

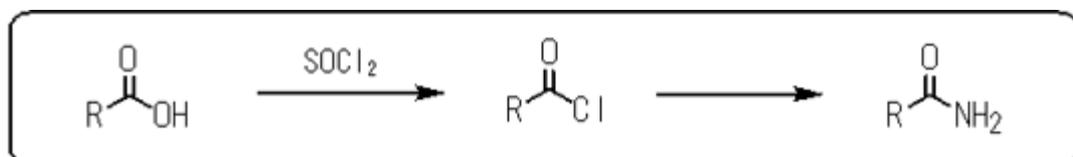
## Reduction



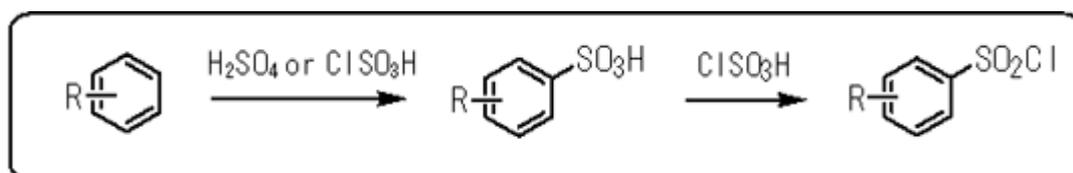
## Oxidations



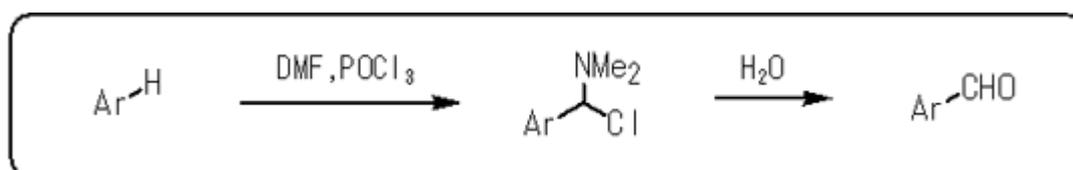
## Acid chlorides and their derivatives



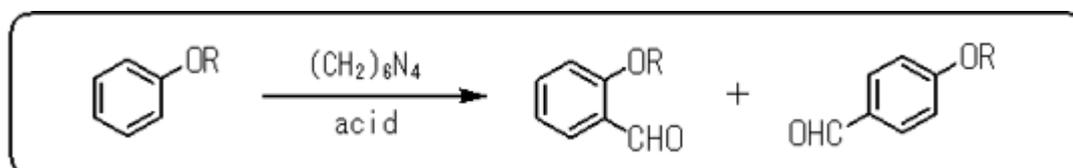
## Sulfonations



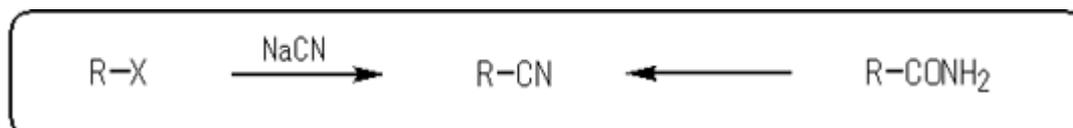
## (Formylations) Vilsmeier reaction



## Duff reaction

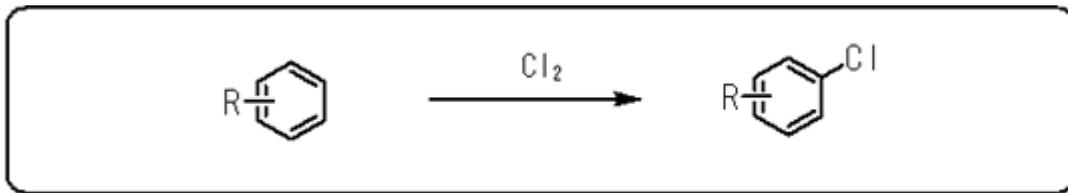


## Cyanations

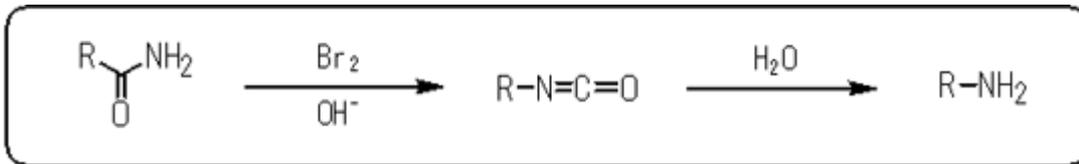


# Fine Chemicals

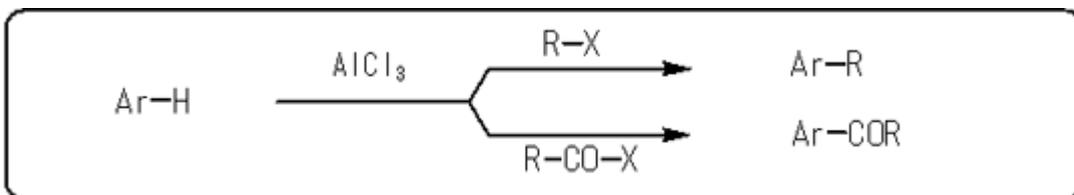
## Halogenations



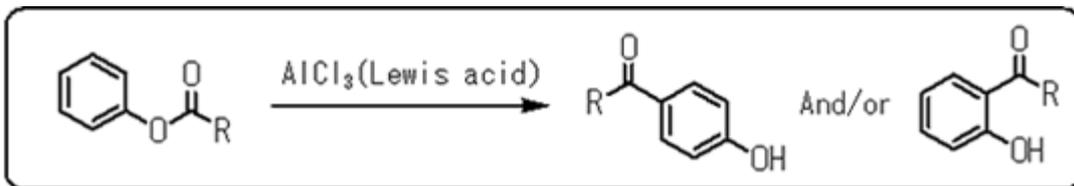
## Hofmann reaction



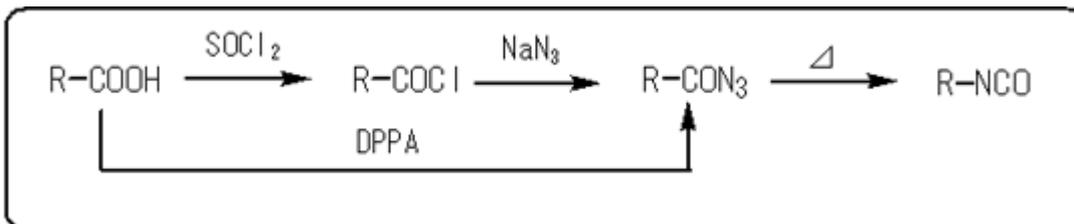
## Friedel-Crafts reaction



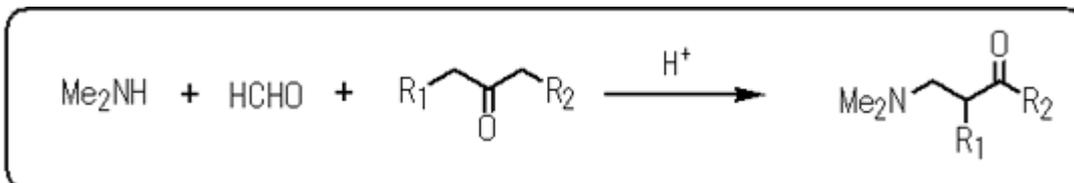
## Fries rearrangement



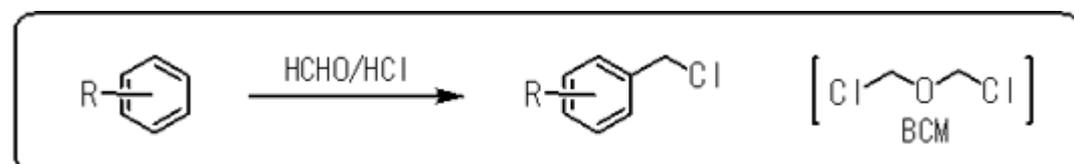
## Curtius rearrangement



## Mannich reaction



## Chloromethylation



Hazardous BCM contamination is suppressed by our technology.

# Fine Chemicals

## Facility Outline

Plant		Pilot Plant	Production Plant (Takasago & Takefu)
Pressure Limit (MPa abs)		0.6	0.6
Decomposition Limit(KPa abs)		0.0	0.0
Temperature Range for Usage (°C)		5 - 140	-5 - 180
REACTORS	GL 0.5m <sup>3</sup>	2	1
	GL 1m <sup>3</sup>		1
	GL 2m <sup>3</sup>	2	6
	GL 3m <sup>3</sup>		5
	GL 5m <sup>3</sup>		8
	GL 6m <sup>3</sup>		2
	GL 8m <sup>3</sup>		11
	GL 12m <sup>3</sup>		2
	Ni based alloy 3m <sup>3</sup>		1
	SUS 0.5m <sup>3</sup>		1
	SUS 2m <sup>3</sup>		3
	SUS 5m <sup>3</sup>		2
	SUS 8m <sup>3</sup>		1
Distillation Tower (Stage)			SUS (30),(35)
Separators(materials)		Basket Centrifuges (PTFE lining,Ni based alloy)	Basket Centrifuges (SUS,PTFE lining,Ni based alloy)
		Decanter (SUS)	Rotary Drum Filters (SUS)
Dryers (materials)		Double Cone (GL)	Double Cone (GL) Nauta Mixers (SUS) Chamber Type (SUS) Vacuum Vibrating Type (SUS)
Environmental Protection Equipments		Active Carbon Absorber	Gravity Sedimentation Tanks Active Carbon Absorbers Waste Liquid Incinerator
Quality Control		cGMP ISO9001 ISO14001	cGMP ISO9001 ISO14001
Note			Passed FDA Inspection (June,1999)

## Plant

### Pilot plant for pharmaceutical intermediate

Our fine chemicals have characteristic technologies, and we continue supplying functional materials and intermediates to many fields such as pharmaceutical and electronic industries. In order to cope to diversifying needs, we built a new pilot plant furnished small and middle size reactors which was designed for speedy production under appropriate management. We built additional commercial plant for pharmaceutical intermediates in Takasago plant in 2007. These investments will enforce our productive capacity and make possible for smoother transition from laboratory, development stage to commercial production.

### Feature of the facility

Under GMP control, this plant is established closed system adequate to prevent contamination and environmental friendly.

Equipped small and medium-size reactors enable to response various customers needs from small scale at early stage to medium volume of trial timely and at low-cost.

The state-of-the-art data management and monitoring system enable to analyze and review the production conditions to optimize them.

### Outline of the pilot plant

- Five stories building, total floor area is about 1,000m<sup>2</sup>
- Reactors : GL 2000L × 2, GL500L × 2
- Stirring wings : Applicable for small quantity
- Centrifugals : Ni based alloy and PTFE lining
- Dryers : 500L Double cone dryer
- The vacuum generator of the acid-proof specification
- Environmental protection equipments : Acid ? alkali absorber, active carbon absorber.
- DCS (distributed control system) equipment

### Outline of the commercial plant

- Five stories building, total floor area is about 1,150m<sup>2</sup>
- Reactors : GL 6000L × 2, GL8000L × 2
- Stirring wings : The twin star, Full zone
- Centrifugals : Ni based alloy (Horizontal)
- Dryers : 3000L Double cone dryer
- The vacuum generator of the acid-proof specification
- Environmental protection equipments : Acid ? alkali absorber, active carbon absorber.
- DCS (distributed control system) equipment

