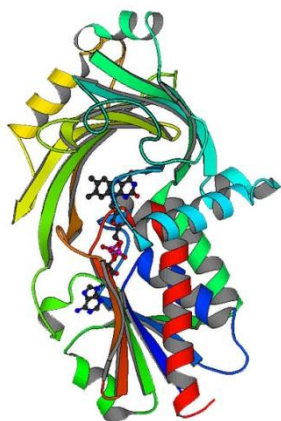




Johnson Matthey Introduces **X-Zyme** biocatalysts



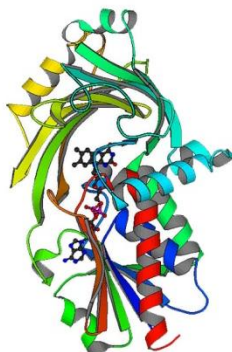


Johnson Matthey Introduces **X-Zyme** biocatalysts

With the recent acquisition of X-Zyme GmbH, a leading biocatalysis company, Johnson Matthey Catalysts is excited to offer a novel family of bio-catalysts which complement the chiral synthetic capabilities of our current chemo-catalyst technology offering.

This combined portfolio of catalytic technologies allows us to design the most efficient synthetic route for our clients.

You now have **one reliable resource** for all your chemo- and bio-catalysis needs.



NEW!!



Johnson Matthey Catalysts

Aldehyde Dehydrogenase Kit

5 enzymes

Application: Aldehyde dehydrogenases catalyse the oxidation of aldehydes to their corresponding carboxylic acids with NAD⁺/NADP⁺ as cofactor. The enzymes exhibit broad substrate spectra with various short- and long-chain aliphatic and aromatic aldehydes.

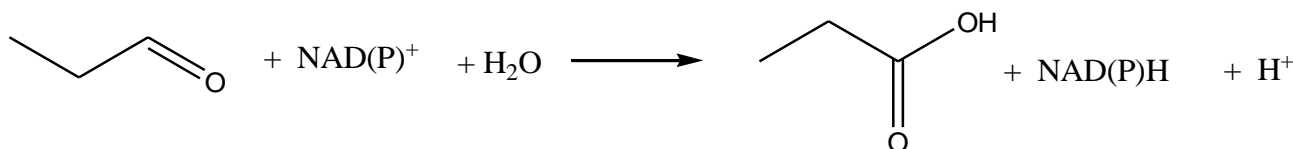
Contents:

Enzymes	5 vials lyophilised
NAD ⁺	1 vial / 50 mg
NADP ⁺	1 vial / 25 mg
Buffer-kPi	1 vial phosphate salt
pH range	6.5 - 8.0

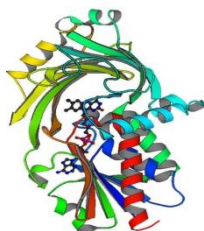
Typical Process Characteristics:

Substrate Concentration	up to 400 mM of aldehydes
Conversion	97 %
pH range	6.5 - 8.0
Temperature	25 – 37 °C
Activity	250 U/ml at 30 °C with acetaldehyde

Example of a broad substrate spectra:



Catalog # ALDHK-1



- Adequate buffer and NADH/NADPH are supplied in the kit for two reaction runs of each enzyme. Additional buffer and cofactors may be purchased through various catalog companies.

- For information on price and availability, please contact your local sales representative.

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NEW!!



Johnson Matthey
Catalysts

Aldehyde Reductase Kit

10 enzymes

Application: Aldehyde Reductases catalyse the reduction of aldehydes to their corresponding primary alcohols with NADH/NADPH as cofactor. A broad range of aldehydes can be converted using these enzymes.

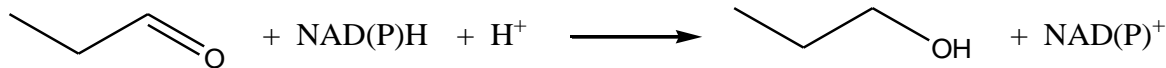
Contents:

Enzymes	10 vials lyophilised
NADH	1 vial / 50 mg
NADPH	1 vial / 25 mg
Buffer-kPi	1 vial phosphate salt
pH range	6.5 - 8.0

Typical Process Characteristics:

Substrate Concentration	up to 400 mM of aldehydes
Conversion	97 %
pH range	6.5 - 8.0
Temperature	25 – 37 °C
Activity	500 U/ml at 30 °C with acetaldehyde

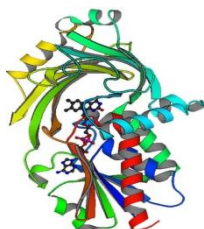
Example of a broad substrate spectra:



Catalog # ALRK-1

- Adequate buffer and NADH/NADPH are supplied in the kit for two reaction runs of each enzyme. Additional buffer and cofactors may be purchased through various catalog companies.

- For information on price and availability, please contact your local sales representative.



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Johnson Matthey Catalysts

Alcohol Dehydrogenases Kit 35 enzymes

Application: A broad range of carbonyl compounds (including aldehydes, aliphatic, aromatic, cyclic ketones, diketones, ketoacetals and ketoesters) can be asymmetrically reduced to their corresponding chiral alcohols with high enantioselectivity using these enzymes.

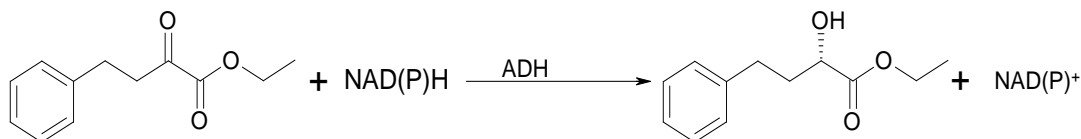
Contents:

Enzymes	35 vials lyophilised
NADH	1 vial / 50 mg
NADPH	1 vial / 25 mg
Buffer-kPi	1 vial phosphate salt
pH range	6.5 - 8.0

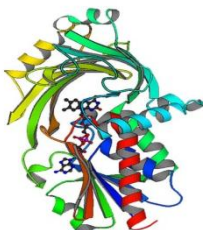
Typical Process Characteristics:

Substrate Concentration	up to 470 mM of ketones
Conversion	97%
pH range	6.5 - 8.0
Temperature	25 - 37°C
Activity	500 U/ml at 30°C with acetophenone

Example of a broad substrate spectra:



X-Zyme biocatalysts



Catalog # ADHK-1

- Adequate buffer and NADH/NADPH are supplied in the kit for two reaction runs of each enzyme. Additional buffer and cofactors may be purchased through various catalog companies.

- For information on price and availability, please contact your local sales representative.

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Johnson Matthey Catalysts

Alcohol Dehydrogenases Kit 12 enzymes

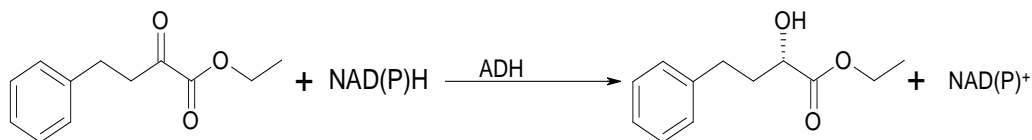
Application: A broad range of carbonyl compounds (including aldehydes, aliphatic, aromatic, cyclic ketones, diketones, ketoacetals and ketoesters) can be asymmetrically reduced to their corresponding chiral alcohols with high enantioselectivity using these enzymes.

Contents:

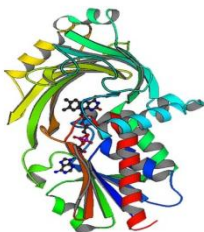
Enzymes	12 vials lyophilised
NADH	1 vial / 50 mg
NADPH	1 vial / 25 mg
Buffer-kPi	1 vial phosphate salt
pH range	6.5 - 8.0

Typical Process Characteristics:

Substrate Concentration	up to 470 mM of ketones
Conversion	97%
pH Optimum	6.0 reduction and 8.0 oxidation
Temperature	30 - 37°C
Activity	500 U/ml at 30°C with acetophenone



X-Zyme biocatalysts



Catalog # ADHK-2

- Adequate buffer and NADH/NADPH are supplied in the kit for two reaction runs of each enzyme. Additional buffer and cofactors may be purchased through various catalog companies.

- For information on price and availability, please contact your local sales representative.

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Johnson Matthey Catalysts

Esterases Kit 50 enzymes

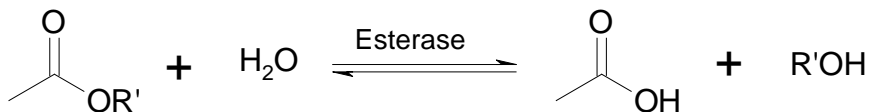
Application: Organic synthesis; synthesis of optically active alcohols or carboxylic acids by ester hydrolysis. Esterification of primary and secondary alcohols with short and long chain carboxylic acids, esterification of amino acids.

Kit Contents:

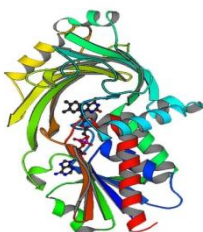
Enzymes	50 vials lyophilised
Buffer-kPi	1 vial phosphate salt
pH range	7.0 - 8.0

Typical Process Characteristics:

Substrate Concentration	up to 200g/L
Conversion	50%
pH Optimum	8.0
Temperature	37°C
Activity	up to 50 U/mg



X-Zyme biocatalysts



Catalog # ESTK-1

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- Adequate buffer is supplied in the kit for two reaction runs of each enzyme. Additional buffer may be purchased through various catalog companies.
- For information on price and availability, please contact your local sales representative.



Johnson Matthey
Catalysts

Esterases Kit

30 enzymes

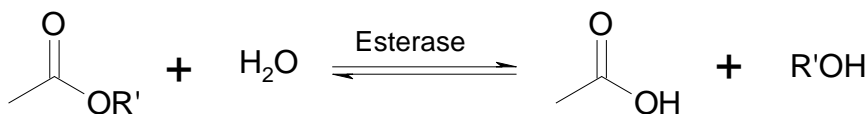
Application: Organic synthesis; synthesis of optically active alcohols or carboxylic acids by ester hydrolysis. Esterification of primary and secondary alcohols with short and long chain carboxylic acids, esterification of amino acids.

Kit Contents:

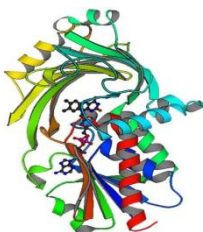
Enzymes	30 vials lyophilised
Buffer-kPi	1 vial phosphate salt
pH range	7.0 - 8.0

Typical Process Characteristics:

Substrate Concentration	up to 200g/L
Conversion	50%
pH Optimum	8.0
Temperature	37°C
Activity	up to 50 U/mg



X-Zyme biocatalysts



- Adequate buffer is supplied in the kit for two reaction runs of each enzyme. Additional buffer may be purchased through various catalog companies.
- For information on price and availability, please contact your local sales representative.

Catalog # ESTK-2

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Johnson Matthey
Catalysts

Esterases Kit

18 enzymes

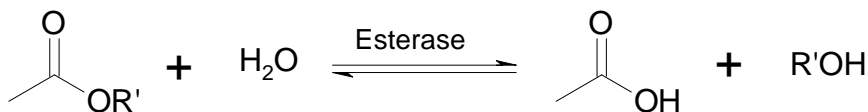
Application: Organic synthesis; synthesis of optically active alcohols or carboxylic acids by ester hydrolysis. Esterification of primary and secondary alcohols with short and long chain carboxylic acids, esterification of amino acids.

Kit Contents:

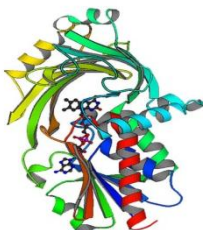
Enzymes	18 vials lyophilised
Buffer-kPi	1 vial phosphate salt
pH range	7.0 - 8.0

Typical Process Characteristics:

Substrate Concentration	up to 200g/L
Conversion	50%
pH Optimum	8.0
Temperature	37°C
Activity	up to 50 U/mg



X-Zyme biocatalysts



- Adequate buffer is supplied in the kit for two reaction runs of each enzyme. Additional buffer may be purchased through various catalog companies.
- For information on price and availability, please contact your local sales representative.

Catalog # ESTK-3

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Lipases Kit

12 enzymes

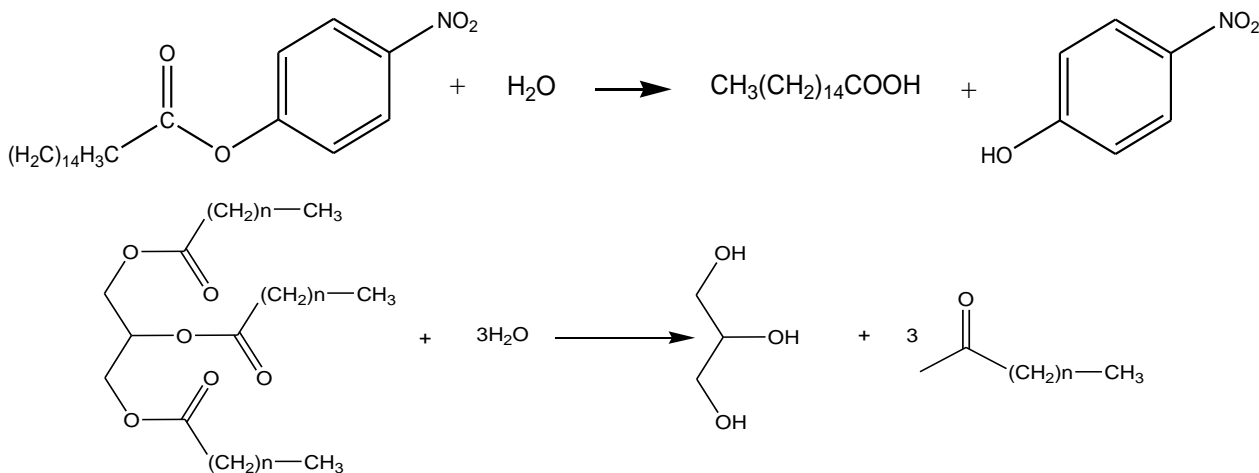
Application: Enantioselective hydrolysis of esters of primary alcohols

Contents:

Enzymes	12 vials lyophilised
Buffer-kPi	1 vial phosphate salt
pH range	7.0 – 8.0

Typical Process Characteristics:

Substrate Concentration	up to 200 g/L
Conversion	98%
pH Optimum	8.0
Temperature	37°C
Activity	up to 400 U/mg

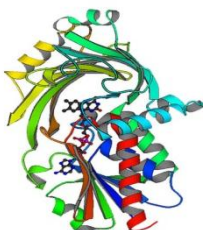


Substrate Specificity: Highest activity with long-chain substrates (C10-C18).

Converts:

- (R)-Ibuprofen esters (ee>91%, E 55)
- pNP-2- phenyl-propanoate
- pNP-cyclohexanoate
- octylacetate
- β -citronolyl acetate
- specificity for esters of primary alcohols
- pNP-2- (4-isobutylphenyl) propanoate (ibuprofen)
- pNP-3-phenyl butanoate
- pNP-2-(6-methoxynaphthalene-2-yl-) propanoate (naproxen)
- phenylacetate
- 2,3-dibutoxypropyl acetate

X-Zyme biocatalysts



- Adequate buffer is supplied in the kit for two reaction runs of each enzyme. Additional buffer may be purchased through various catalog companies.

- For information on price and availability, please contact your local sales representative.

Catalog # LIPK-1

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Johnson Matthey
Catalysts

Ene Reductases Kit

8 enzymes

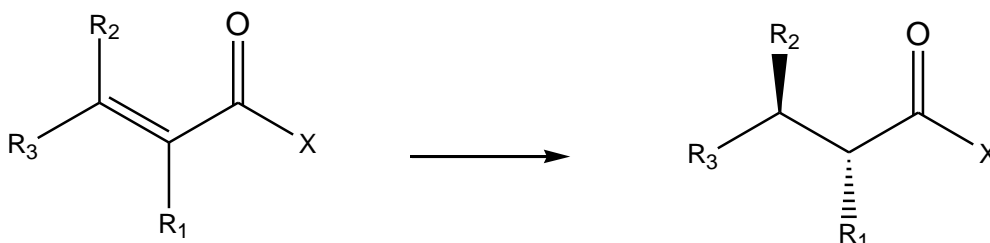
Application: asymmetric reduction of carbon-carbon double bonds in non-activated enoates and activated alkenes (substituted with electron withdrawal groups), such as α,β -unsaturated ketones, aldehydes, nitrile, and nitro-derivatives, cyclic imides, and unsaturated carboxylic acids.

Kit Contents:

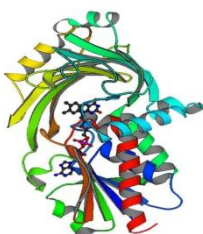
Enzymes	8 vials lyophilised
NADH	1 vial / 50 mg
NADPH	1 vial / 25 mg
Buffer-kPi	1 vial phosphate salt
pH range	7.0 - 8.0

Typical Process Characteristics:

Substrate Concentration	up to 200 g/L
Conversion	>95%
pH Optimum	7.0-7.5
Temperature	30-35°C
Activity	up to 50 U/mg



X-Zyme biocatalysts



- Adequate buffer and NADH/NADPH are supplied in the kit for two reaction runs of each enzyme. Additional buffer and cofactors may be purchased through various catalog companies.

- For information on price and availability, please contact your local sales representative.

Catalog # ENERK-1

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Johnson Matthey
Catalysts

Transaminase Kit

12 enzymes

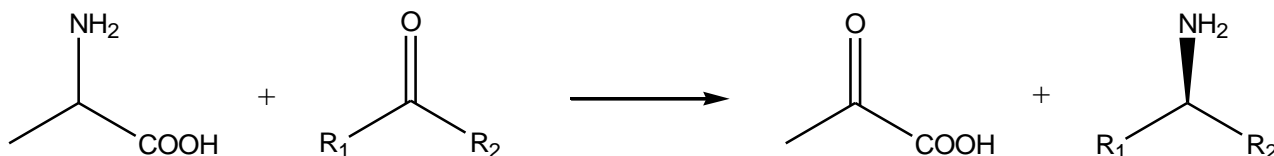
Application: asymmetric amino transfer to prochiral ketones, to give chiral amines.

Kit Contents:

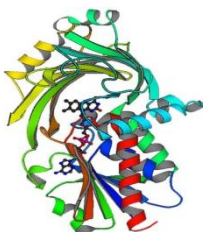
Enzymes	12 vials lyophilised
Cofactor	1 vial Pyridoxal phosphate / 5mg
Buffer-kPi	1 vial phosphate salt
pH range	7.0 - 8.0

Typical Process Characteristics:

Substrate Concentration	up to 200 g/L
Conversion	>95% with appropriate process configuration
pH Optimum	7.0
Temperature	30°C
Activity	up to 50 U/mg



X-Zyme biocatalysts



Catalog # TRAMK-1

- Adequate buffer is supplied in the kit for two reaction runs of each enzyme. Additional buffer may be purchased through various catalog companies.
- For information on price and availability, please contact your local sales representative.

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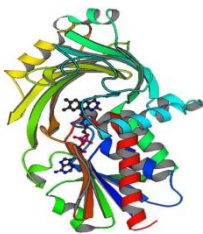
Cofactor Regeneration Kit

8 enzymes

- **Malic decarboxylase –A (NAD⁺-dependent) 20U/mg**
- **Malic decarboxylase –B (NADP⁺-dependent) 30U/mg**
 - Product description: (S)-malate oxidoreductase (oxaloacetate-decarboxylating)
 - Reaction: L-malate + NADP⁺ = CO₂ + pyruvate + NADPH
- **D-Glucose dehydrogenase – A (NAD(P)⁺-dependent, both) 25 U/mg**
- **D-Glucose dehydrogenase – B (NAD(P)⁺-dependent, both) 15 U/mg**
 - Product description: D-Glucose NADP 1-oxidoreductase
 - Reaction: beta-D-glucose + NAD(P)⁺ = D-glucono-1,5-lactone + NAD(P)H
- **Alcohol Dehydrogenase (NADP⁺-dependent) 3 U/mg**
 - Product description: S-Alcohol: NADP⁺ oxidoreductase
 - Reaction: 2-Propanol + NADPH = Acetone + NADPH
- **Phenylalanine dehydrogenase (NAD⁺-dependent) 20 U/mg**
 - Product description: Oxidation of L-Phe. NAD⁺ oxidoreductase
- **Formate Dehydrogenase (NAD⁺-dependent) 0.5 U/mg**
 - Product description: Formate: NAD oxidoreductase
 - Reaction: Formate + NAD⁺ = CO₂ + NADH
- **Isocitrate Dehydrogenase (NADP⁺-dependent) 3 U/mg**
 - Product description: Isocitrate: NADP oxidoreductase
 - Reaction: Isocitrate + NADP⁺ = α-ketoglutarate + CO₂ + NADP

X-Zyme biocatalysts

- Adequate buffer and NADH/NADPH are supplied in the kit for two reaction runs of each enzyme. Additional buffer and cofactors may be purchased through various catalog companies.
- For information on price and availability, please contact your local sales representative.



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