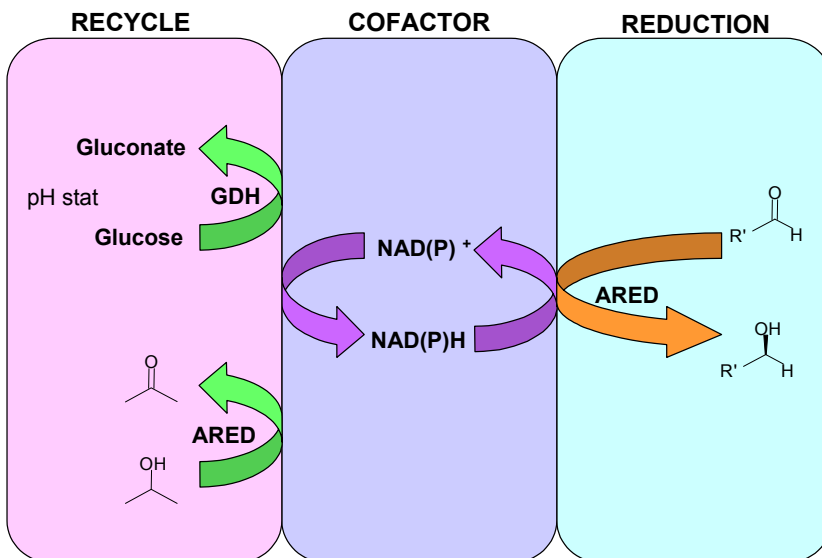


Aldehyde Reductase (ARED) Enzyme Screening Kit: AESK-1600

Applications:

Synthesis of primary alcohols by enzymatic reduction of aldehydes. Selective reduction of an aldehyde in the presence of a ketone.



Kit Description:

The kit contains 16 diverse pre-formulated aldehyde reductase (ARED) biocatalysts as dry powders, as well as pre-prepared phosphate buffer ready for use, NAD and NADP cofactors, and glucose dehydrogenase (GDH) for the cofactor recycle system. Note that for some enzymes, it is possible to recycle cofactor using an alcohol donor such as isopropyl alcohol (IPA).

Contents:

AREDs	16 vials lyophilised powder (50 mg each)
NADP	1 vial (80 mg)
NAD	1 vial (80 mg)
GDH	1 vial (250 mg)
Glucose	1 vial (2.5 g)
DMSO	1 vial (10 mL)
0.1M KH ₂ PO ₄ buffer (pH 7.0)	1 bottle (200 mL)

An adequate supply of NADP, NAD, GDH, glucose, and buffer has been provided for 3 screens with each enzyme. Additional GDH, buffer, glucose or cofactors are available for purchase from Almac.

Storage:

The ARED enzyme screening kit should be stored in a refrigerator at <4 °C to preserve activity.

Enzyme List and Cofactor preference:

In most cases ARED enzymes will accept both NADP and NAD as cofactors, but exhibit a preference for one over the other. These cofactor preferences are listed in the table below.

CRED	Cofactor
AR-01	NADP
AR-02	NADP
AR-03	NADP
AR-04	NADP
AR-05	NAD
AR-06	NADP
AR-07	NAD
AR-08	NAD
AR-09	NADP
AR-10	NADP
AR-11	NADP
AR-12	NADP
AR-13	NADP
AR-14	NADP
AR-15	NADP
AR-16	NADP

Typical Procedure – Reduction Reaction:

Reagents:

- A: 15 mg/mL solution of ARED in buffer.
- B: 300 mg/mL solution of glucose in buffer.
- C: 10 mg/mL solution of NADP in buffer.
- D: 10 mg/mL solution of NAD in buffer.
- E: 20 mg/mL solution of GDH in buffer.

Procedure:

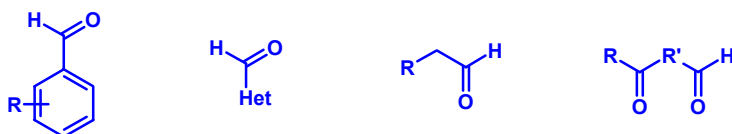
1. Into a flask/vial, add reagent A (1 mL).
2. Add reagent B (100 μ L).
3. Add reagent C or D (100 μ L), depending on enzyme preference (see cofactor preference table).
4. Add reagent E (100 μ L).
5. Add a solution of ~20 mg aldehyde substrate in organic solvent (50-150 μ L, depending on solubility) such as DMSO or MTBE.
6. Shake/stir at room temperature (or ideally 30 °C). Agitate overnight.
7. Extract product with an organic solvent (MTBE, EtOAc etc.).
8. Analyse sample by chiral GC/HPLC for conversion and product ee.

It is not advisable to keep stock solutions of cofactors or enzymes, as these will degrade over time. Make each stock solution fresh on the day of use.

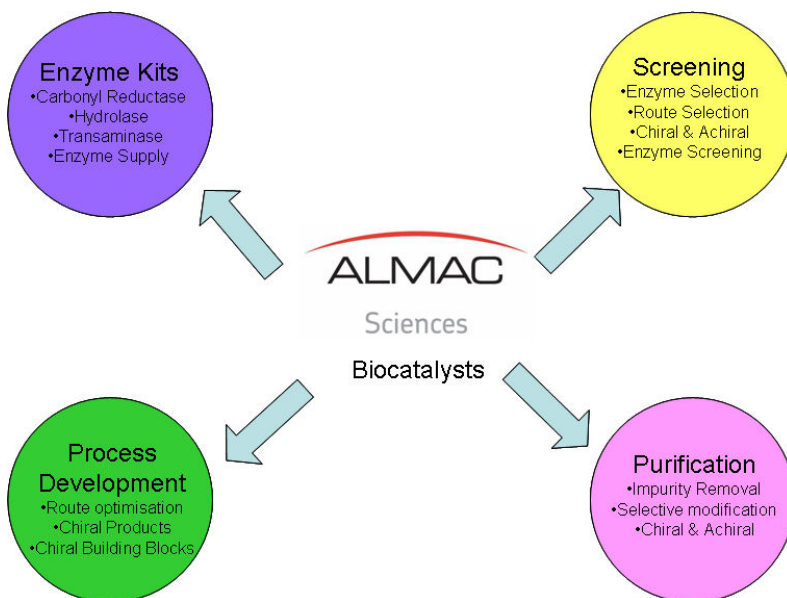
A sufficient supply of all contents has been provided for 3 screens with each enzyme. Additional components are available for purchase from Almac.

Substrate range

A wide variety of structurally diverse aldehydes, including aliphatic & aromatic aldehydes, dialdehydes, ketoaldehydes, cyclic aldehydes and heterocyclic aldehydes, can be reduced using AREDs. A selection is shown below.



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