

## Title (en)

WATER INSOLUBLE ENCAPSULATED ENZYMES PROTECTED AGAINST DEACTIVATION BY HALOGEN BLEACHES

## Publication

**EP 0286773 A3 19900321 (EN)**

## Application

**EP 88100045 A 19880105**

## Priority

US 4019187 A 19870417

## Abstract (en)

[origin: EP0286773A2] A composition capable of releasing active enzyme into an aqueous, active chlorine containing media which in a first aspect comprises an enzyme core encapsulated with an initial coating of a time-release substance, a first coating of a bleach-neutralizing substance and a second coating of a time-release substance. In a second aspect, the composition comprises an enzyme encapsulated in a time-release substance designed to delay release of the enzyme in dissolution for a first-time delay, and a bleach-neutralizing substance, present as either a core material and/or a first coating on a diluent core, which is encapsulated in a time-release substance designed to delay release of the bleach-neutralizing substance into solution for a second-time delay; the first-time delay being longer than the second-time delay so that the bleach-neutralizing substance will be released and completely neutralize all active chlorine present in the solution before the enzyme is released. In a third aspect, the composition comprises an enzyme core encapsulated with a time-release substance, a diluent core encapsulated with a first coating of a bleach-neutralizing substance and a second coating of a time-release substance, and a bleach-neutralizing substance core encapsulated with a time-release substance. The invention further includes a cleaning composition which is particularly effective in warewashing which comprises one of the encapsulated enzyme-containing compositions described above, chlorine bleach, and at least one additional detergent component.

## IPC 1-7

**C11D 3/386**; **C11D 3/395**

## IPC 8 full level

**C11D 3/386** (2006.01); **C11D 3/395** (2006.01); **C11D 17/00** (2006.01); **C12N 9/96** (2006.01); **D06L 3/06** (2006.01)

## CPC (source: EP KR)

**C11D 3/386** (2013.01 - KR); **C11D 3/38672** (2013.01 - EP); **C11D 17/0039** (2013.01 - EP)

## Citation (search report)

- [X] EP 0206417 A2 19861230 - PROCTER & GAMBLE [US]
- [X] BE 838125 A 19760730
- [AD] US 4421664 A 19831220 - ANDERSON CHARLES R [US], et al
- [XP] WO 8707292 A1 19871203 - NOVO INDUSTRI AS [DK]

## Cited by

US6730652B1; US5225102A; US5254287A; EP0415652A3; US5733763A; EP0723006A3; EP2557938A4; WO2012169997A1; WO0063341A1; WO9009440A1; WO2017102477A1; WO2018183662A1; WO9009428A1; WO2011093770A1; EP0809687B2

## Designated contracting state (EPC)

AT BE CH DE ES FR GB GR IT LI NL SE

## DOCDB simple family (publication)

**EP 0286773 A2 19881019**; **EP 0286773 A3 19900321**; **EP 0286773 B1 19940810**; AT E109822 T1 19940815; AU 8317487 A 19881020; BR 8801839 A 19881122; CA 1305082 C 19920714; DE 3850991 D1 19940915; DE 3850991 T2 19941215; DK 8288 A 19881018; DK 8288 D0 19880108; ES 2060609 T3 19941201; FI 880456 A0 19880201; FI 880456 A 19881018; JP 2588927 B2 19970312; JP S63296690 A 19881202; KR 880012755 A 19881129; KR 970001229 B1 19970204; NO 880372 D0 19880128; NO 880372 L 19881018; NZ 223135 A 19891027

## DOCDB simple family (application)

**EP 88100045 A 19880105**; AT 88100045 T 19880105; AU 8317487 A 19871231; BR 8801839 A 19880415; CA 557618 A 19880128; DE 3850991 T 19880105; DK 8288 A 19880108; ES 88100045 T 19880105; FI 880456 A 19880201; JP 9327388 A 19880415; KR 880004349 A 19880416; NO 880372 A 19880128; NZ 22313588 A 19880108