



11) Publication number:

0 471 410 A3

## EUROPEAN PATENT APPLICATION

(21) Application number: **91202036.9** 

2 Date of filing: 07.08.91

(12)

(51) Int. Cl.<sup>5</sup>: **C11D 17/00**, C11D 3/386, C11D 3/37, C11D 3/39

Priority: 15.08.90 US 567589

Date of publication of application:19.02.92 Bulletin 92/08

② Designated Contracting States:
CH DE ES FR GB IT LI NL SE

Date of deferred publication of the search report: 01.07.92 Bulletin 92/27

Applicant: UNILEVER NV
Burgemeester s'Jacobplein 1 P.O. Box 760
NL-3000 DK Rotterdam(NL)

(84) CH DE ES FR IT LI NL SE

7) Applicant: UNILEVER PLC
Unilever House Blackfriars P.O. Box 68
London EC4P 4BO(GB)

⊗ GB

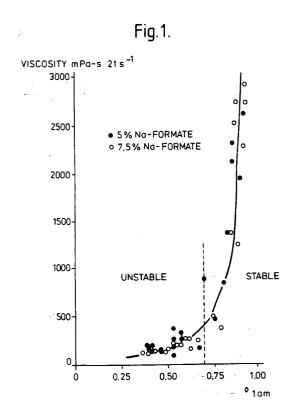
Inventor: Kaiserman, Howard Bruce Unilever Research US Inc., 45 River Road Edgewater, NJ 07020(US) Inventor: Siuta-Mangano, Patricia Unilever Research US Inc., 45 River Road Edgewater, NJ 07020(US)

(74) Representative: Kan, Jacob Hendrik, Dr. et al Unilever N.V. Patent Division P.O. Box 137

NL-3130 AC Vlaardingen(NL)

Structured liquid detergent compositions containing subtilisin mutants.

The subject invention relates to mutant subtilisin proteases having substitution in at least 1 amino acid residue and to their use in structured detergent compositions in view of the enhanced stability they provide. In one embodiment of the invention, the enhanced enzyme stability in structured liquids comprising a decoupling polymer is shown and in a second embodiment, the enhanced stability of the mutant enzyme in a structured liquid comprising perborate is shown. None of these effects would have been predicted in advance.





## **EUROPEAN SEARCH REPORT**

EP 91 20 2036

Category		ndication, where appropriate,		CLASSIFICATION OF THE
	of relevant pa	ressages	to claim	APPLICATION (Int. Cl.5)
P,X	EP-A-0 405 901 (UNILEV	ER PLC)	1,6-8,	C11D17/00
			10,11	C11D3/386
	* page 33, line 8 - li	ne 48 *		C11D3/37
	****			C11D3/39
P,X	EP-A-0 405 902 (UNILEV	ER PLC)	1,6,7,11	
	* page 8, line 9 - line	a 19 *		
	<del></del> -	· <del>-</del>		
Y D	WO-A-8 705 050 (GENEX)		1,6,7	
	* page 31 - page 32; c1			
	& US-A-4 980 288 (P.N.	BRYAN)		
	<del></del>	<b>-</b>		
Y	EP-A-0 346 995 (UNILEVI	ER NV)	1,6,7	
	* whole document *			
_		. <del></del>		
P,A	EP-A-0 385 522 (UNILEVI	ER NV)	1,6,7	
	* page 11; examples *			
ĺ	* claims *			
.	ED 4 0 370 661 (DDCC===	- A AMBIE 60 '	0.010	
^	EP-A-0 378 261 (PROCTE	( & GAMBLE CU, )	8,9,13	
	* claims *			
_			1,611	TECHNICAL FIELDS SEARCHED (Int. Cl.5)
E	EP-A-0 476 726 (UNILEVI	ER NV)	1,6-11	
		- 27 ±		C11D
	* page 5, line 20 - lin			C11B C12N
	* page 5, line 51 - line * Pages 8-14, examples			CIZN
	* page 6, line 1 - line			
	page o, rine 1	- · · · · · · · · · · · · · · · · · · ·		
E	EP-A-0 450 702 (UNILEVI	R NV)	1,6,7,11	
	* page 5, line 29 - lin	•	-,•,•,	
	* page 6, line 8 - line			
	page 0,	-		
P.A	WO-A-9 015 857 (UNILEVE	ER NV)	1,13	
· <b>,</b> · ·	* Whole document *	<b>,</b>	"	
	The present search report has h	een drawn up for all claims		
	Place of search	Date of completion of the search		Examiner
	BERLIN	23 APRIL 1992		I-WABLAT B.
	CATEGORY OF CITED DOCUME	NTS T theory or m	rinciple underlying the	invention
•		E : earlier pate	nt document, but publi	shed on, or
X : part Y : part	icularly relevant if taken alone icularly relevant if combined with an	after the fil other D : document o	after the filing date D: document cited in the application L: document cited for other reasons	
docu	ment of the same category nological background	L: document c		
	ministrical decentring			