FORM 1

REGULATION 9

COMMONWEALTH OF AUSTRALIA

PATENTS ACT 1952

APPLICATION FOR A STANDARD PATENT

We, RHONE-POULENC CHIMIE, a French Company, of 25, Quai Paul Doumer, 92408, Courbevoie, Cedex, France, hereby apply for the grant of a Standard Patent for an invention entitled:—

"BIOLOGICALLY STABLE, UNTANNED PELTS, IN WET FORM"

which is described in the accompanying Complete Specification.

Details of basic application:—

Number: 89/10193

Country: France

Date: 28th July, 1989

Our address for service is: SHELSTON WATERS

Clarence Street

SYDNEY, N.S.W. 2000.

DATED this 25th Day of July, 1990

RHONE-POULENC CHIMIE

by [Signature]

Fellow Institute of Patent Attorneys of Australia of SHELSTON WATERS

To: The Commissioner of Patents

MODEM A.C.T. 2606

File: D.B. R-89

Fee: $150.00

S016291 26/07/90
CONVENTION APPLICATION BY A COMPANY
FORM 8 - REGULATION 12 (2)
AUSTRALIA
PATENTS ACT 1952
R 4059

DECLARATION IN SUPPORT OF A CONVENTION APPLICATION FOR A PATENT

In support of the Convention Application made by .................................................................

(a) .................................................................................................................................
RHONE-POULENC. CHIMIE

(b) Hereinafter referred to as “Applicant”) for a patent for an invention entitled:

(c) .................................................................................................................................
"BIOLOGICALLY STABLE, UNTANNED PELTS, 
IN WET FORM"

(d) .................................................................................................................................

1. (a) .................................................................................................................................
Marie-Claude DUTRUC-ROSSET

(b) .................................................................................................................................
RHONE-POULENC

(c) .................................................................................................................................
25, Quai. Paul. Doumer...92408,..Courbevoie...Cedex...France.

do solemnly and sincerely declare as follows:

1. I am authorised by Applicant to make this declaration on its behalf.

2. The basic Application(s) as defined by section 141 of the Act was / were made

(a) .................................................................................................................................
FRANCE on the 28th day of JULY 1989

(b) .................................................................................................................................
RHONE-POULENC CHIMIE

3. (a) .................................................................................................................................
Jean-Pierre COMMUNAL of 15, avenue Docteur Neige-

(b) .................................................................................................................................
94210 LA VARENNE SAINT HILAIRE and Gerard GAVEND of

(c) .................................................................................................................................
5, rue Longefer - 69008 - LYON both of FRANCE


The actual inventor(s) of the invention and the facts upon which Applicant is entitled to make the
Application are as follows:

APPLICANT IS THE ASSIGNEE OF THE SAID INVENTORS.

4. The basic Application(s) referred to in paragraph 2 of this Declaration was / were the first
Application(s) made in a Convention country in respect of the invention, the subject of the
Application.

DECLARED at .....................................................................................................................

(a) .................................................................................................................................
COURBEVOIE, FRANCE

(b) .................................................................................................................................
14TH day of OCTOBER 1990

(c) .................................................................................................................................
Marie-Claude DUTRUC-ROSSET

(Signature of Declarant)

To THE COMMISSIONER OF PATENTS.

SHELSTON WATERS, PATENT ATTORNEYS, 55 CLARENCE STREET, SYDNEY, AUSTRALIA

This printed form is for guidance in completing this part.
BIOLOGICALLY STABLE, UNTANNED PELTS, IN WET FORM

Colorless wet pelts, biologically stable, untanned, completely chromium-free, containing from 50 to 70 % of water, by weight, from 5 to 30 % of total mineral matter by weight with respect to the dry and degreased leather, from 0,5 to 1,5 % of $\text{Al}_2\text{O}_3$ by weight with respect to the dry and degreased leather and from 85 to 90 % of dermal substances by weight with respect to the dry and degreased leather, wet pelts characterised in that they are intrinsically insensitive to moulds without addition of supplementary fungicides and bacteriostatic agents.

Preparation process of the wet pelts subject of claims 1 and 2 by impregnation of pickled pelts at a pH of the order of 3 to 4 by means of a bath based on basic aluminium polychloride or on a basic aluminium polychlorosulphate in an amount corresponding to 0,08 to 0,45 % of $\text{Al}_2\text{O}_3$ by weight with respect to the weight of pelt in tripe, followed by basification to a final pH of the order of 4 to 4,4 and by optional spinning.

Process according to claim 3 or 4 characterised in that the formula of the basic aluminium polychloride or polychlorosulphate is as follows:

1. $\text{Al}_n(\text{OH})_m\text{Cl}_{3n-m}$
2. $\text{Al}(\text{OH})_m\text{Cl}_{3m-2n}(\text{SO}_4)_n$

where $m$ is included between 1,1 and 2,1 ; $n$ between 0,12 and 0,18 ; its basicity is included between 0,37 and 0,70.
(11) 59840/90

- $\text{Al}_n (\text{OH})_m \text{Cl}_{3n-m-2k} (\text{SO}_4)_k$

where $k, m$ and $n$ are positive integers with $3n > m + 2k$ and $k/n = 0.01$ to $0.3$; its basicity $m/3n$ is included between 0.3 and 0.7.

- $[\text{Al}_n (\text{OH})_{3n-m-2p} \text{Cl}_m (\text{SO}_4)_p]_z$

where $(3n-m-2p)/3n$ is $0.4$ to $0.7$; $p = 0.04$ to $0.25$; $m/p = 8$ to $36$, $m$, $n$ and $p$ being integers and $z$ being equal to at least 1.

- $\text{Al}_n (\text{OH})_m (\text{SO}_4)_k \text{Cl}_{3n-m-2k}$

where basicity $m/3n$ is included between 0.40 and 0.65, the ratio $\text{Al}$ equivalent/Cl equivalent is included between 2.8 and 5, the mean molecular mass by weight $M_w$ ranging from 10 000 to 500 000, the true hydrodynamic diameters $\phi Z$ and $\phi W$ having the following values:

$\phi Z (\AA)$ from 90 to 450,

$\phi W (\AA)$ from 50 to 300.
COMMONWEALTH OF AUSTRALIA

FOR OFFICE USE:

Application Number: 
Lodged: 

Complete Specification Lodged: 
Accepted: 
Published: 

Priority: 
Related Art: 

Name of Applicant: RHONE-POULENC CHIMIE 

Address of Applicant: 25, Quai Paul Doumer, 92408, Courbevoie, Cedex, France. 

Actual Inventor: Jean-Pierre Communal and Gerard Gavend 

Address for Service: SHELSTON WATERS, 55 Clarence Street, Sydney 

Complete Specification for the Invention entitled: 
"BIOLOGICALLY STABLE, UNTANNED PELTS, IN WET FORM"

The following statement is a full description of this invention, including the best method of performing it known to us:-
The present invention pertains to biologically stable, untanned pelts in wet form, also called B.S.H. (“Wet Stabilised White”).

Commercially, pelts can appear in various forms:
- raw (salted, pickled, dry-salted and fresh ...)
- pickled (treatment by a strong acid solution in the presence of salt)
- tanned (particularly chromium treatment “wet-blue”)
- semi-worked (stain)
- finished.

Depending upon their presentation, raw pelts are subject to problems at the level of saline pollution, of re-wetting ... Pickled pelts, on the other hand, are fragile in that they have not been chemically treated and they require protection from swelling.

The presentation of merchandises in “wet-blue” form is not free from disadvantages, particularly from the ecological viewpoint; indeed, without using complementary additives and/or adapted operative modes for exhausting chromium, the effluent solutions released have a high chromium concentration, originating from the tanning baths themselves and from the re-tanning operations (displacement by re-tanning agents).

In addition, up to 40 % of the chromium baths are lost in the form of solid wastes during the slitting operation and during the procedure used for producing a uniform thickness.

To reduce the chromium concentration of the effluents, it has been proposed (French patent N° 2,239,525) to proceed, prior to chromium tanning, to a treatment of 10 to 12 hours at a pH of the order of 3,9 to 4,2 by means of basic aluminium polychloride according to a quantity, expressed as Al₂O₃, corresponding to 1 to 4 % of the weight of pelt to be treated.

It consists of a true, irreversible pre-tanning operation since it transforms the collagen molecule in a considerable manner.

Over the last decade, the leather industry has become interested in novel products constituting an intermediate phase of preconditioning of pelts following pickling; these products offer several advantages:
- they are chromium-free
- they are likely to undergo slitting and the procedure aimed at producing a uniform thickness (destined to produce leathers for different markets) prior to the tanning operations; the slitting operation and the procedure used to produce a uniform thickness being performed on these novel products therefore allows to avoid the production of chromated solid wastes.
- the imperfections existing in the pelts can be detected very early in the leather transformation process, permitting a better selection and a better orientation of the pelts according to their quality and to the needs of the market.
- manufacturing deviations, such as thin crusts, and all the wastes can be revalorised by conversion into industrial gelatin or alimentary collagen, since they do not contain any chromium.

- they permit the presentation of a pelt whose stable character can be easily reversed; indeed, following elimination of the stabilization products, these materials are equivalent to the initial pickled pelt since the collagen become available again for conventional tanning operations.

- their temperature of retraction and their stability over time are high, permitting their storage over long periods under difficult conditions (for instance long distance transportation over several months).

These novel products are called "Wet Stabilized White" (B.S.H.) when they are wet or "Dry Stabilized White" (B.S.S.) when they are dry (French patent n° 2.610.643).

The present invention pertains to colorless wet pelts, biologically stable, untanned, completely chromium-free, containing from 50 to 70 %, preferably from 55 to 65 % of water by weight, from 5 to 30 %, preferably from 7 to 12 % of total mineral matter by weight with respect to the dry and degreased leather, from 0,5 to 1,5 %, preferably less than 1 % of Al\(_2\)O\(_3\) by weight with respect to the dry and degreased leather and from 85 to 90 % of dermal substances by weight with respect to the dry and degreased leather, wet pelts characterised in that they are intrinsically insensitive to moulds without addition of supplementary fungicides and bacteriostatic agents.

The BSH of the invention can be obtained by impregnation of pickled pelts, at a pH of the order of 3 to 4, preferably of the order of 3,5 to 3,8, by means of a bath based on basic aluminium polychloride or on a basic aluminium polychlorosulphate in an amount corresponding to 0,08 to 0,45 preferably 0,10 to 0,25 % of Al\(_2\)O\(_3\) by weight with respect to the weight of the pelt in tripe, followed by basification to a final pH of the order of 4 to 4,4 and by optional spinning.

The pickled pelts used originate from various animal species such as ovine, caprine, bovine ... and are obtained by pickling according to the usual pickling processes applied to pelts having undergone conventional river operations (greening, hair-stripping, scraping, conservation).

Among the basic aluminium polychlorides and the basic aluminium polychlorosulphates, reference can be made to those of formula:

- \(\text{Al}_n(\text{OH})_m\text{Cl}_{3n-m}\) (I)

where \(n\) and \(m\) are any positive integer with \(3n-m\) positive

- \(\text{Al}(\text{OH})_m\text{Cl}_{3-m-2n}\text{SO}_4_n\) (II)

where \(m\) is included between 1,1 and 2,1 ; \(n\) between 0,12 and 0,18 ; its basicity is included between 0,37 and 0,70.

This product is described in French patent n° 2.239.525.

- \(\text{Al}_n(\text{OH})_m\text{Cl}_{3n-m-2k}\text{SO}_4_k\) (III)
where $k$, $m$ and $n$ are positive integers with $3n > m + 2k$ and $k/n = 0.01$ to 0.3; its basicity $m/3n$ is included between 0.3 and 0.7.

This product is described in US patent n° 3,929,666.

$$- [\text{Al}_n \text{(OH)}_{3n-m-2p}\text{Cl}_m \text{(SO}_4\text{)}_p]_2 \quad (IV)$$

where $(3n-m-2p)/3n = 0.4$ to 0.7 ; $p = 0.04$ to 0.25 ; $m/p = 8$ to 35, $m$, $n$ and $p$ being integers and $z$ being equal to at least 1.

This product is described in English patent n° 2.128.977.

$$\text{Al}_n \text{(OH)}_m \text{(SO}_4\text{)}_k \text{Cl}_{3n-m-2k} \quad (V)$$

where basicity $m/3n$ is included between 0.40 and 0.65, the ratio $\text{Al}$ equivalent/Cl equivalent is included between 2.8 and 5, the mean molecular mass by weight $M_w$ ranging from 10 000 to 500 000, preferably from 10 000 to 300 000, the true hydrodynamic diameters $\phi Z$ and $\phi W$ having the following values:

$\phi Z$ (A) from 90 to 450,
$\phi W$ (A) from 50 to 300.

This product is described in European patent n° 218.487.

The basic aluminium polychlorides or polychlorosulphates can be used in the form of aqueous solutions at 4-20 \% of active matter, expressed as $\text{Al}_2\text{O}_3$ by weight, or in the form of powder.

The operation of impregnation can be carried out at normal temperature (10 to 35\circ C for instance) in a fuller of adjustable rotating speed with possibility of re-heating of the impregnation bath.

The operation of basification is then performed, for example by means of sodium bicarbonate or carbonate, of magnesium oxide, of dolomite... in sufficient quantity to obtain a bath pH of the order of 4 to 4.4.

It can be seen that remarkably, the product obtained is little sensitive to mould and this without the addition of fungicides or bacteriostatic agents. Thus, following 7 weeks of storage at 35\circ C, the B.S.H. of the invention still do not exhibit any moulds.

An improvement of the operation of impregnation, permitting the prevention of any accidental mould phenomenon, consists of introducing into the treatment bath from 0.5 to 5 \% by weight with respect to the weight of tripe, of a vinylic acid such as methacrylic, allylic and especially acrylic acid and/or from 0.02 to 1.25 \% by weight (expressed as oxide) with respect to the weight of tripe of one of their metallic salts (of rare earths of the lanthanum, cerium type...; of zinc, of nickel...) and particularly of lanthanum acrylate.

The Applicant finally established that these vinylic acids or their metallic salts reinforce the antifungal activity of the basic aluminium polychloride or polychlorosulphate based treatment bath.

These vinylic acids or their salts can be eliminated or converted for subsequent utilization of the wastes, by polymerization by means of an oxido-reducing agent, of X-rays, etc...
Although not necessary, antifungal agents currently used in the treatment of pelts can in addition be introduced into the impregnation bath (derivatives of chlorinated phenols, benzothiazoles, isothiazolones).

The B.S.H. of the invention possess particularly good re-wetting properties making it possible, particularly in the case of small pelts (caprine, ovine), not to use re-wetting agents for their transformation into dry stabilized pelt B.S.S. The B.S.H of the invention are simply introduced for re-wetting into a fuller in the presence of water, with minimum mechanical work so as not to damage the pelts through abrasion.

The B.S.H. of the invention are easily reversible; indeed the latter can be re-converted to raw pelt by acid treatment in a fuller (for instance by means of an aqueous solution of hydrochloric acid, of sulphuric acid ...) so as to eliminate the aluminium salts.

The B.S.H. that are the subject of the invention present a minimum retraction temperature of at least 60°C, usually of the order of 64 to 68°C, perfectly compatible with the slitting operation and with the procedure used to produce a uniform thickness.

The B.S.H can then undergo the conventional tanning operations: chromium tanning with fuller use of the chromium bath since the B.S.H. contains aluminium salts ; synthetic tanning ; vegetal tanning or combinations of these various tanning types.

The following examples are given by way of indication and cannot be considered as a limit to the scope and essence of the invention.

**EXAMPLE 1**

Cow half rump-hide having undergone river operations (greening, hair-stripping, scraping, conservation) are subjected to the operations of tanning and stabilization according to the invention.

The apparatus used is a wooden fuller of 800 liters with adjustable speed of rotation. The percentages given are by weight and calculated with regard to the weight of tripe, unless otherwise specified.

**Pickling** : rotation speed : 6 to 8 rpm

The half rump-hides are treated in the following baths :

1)  
- cold water (18-20°C) : 25 %
- sea salt : 5 %
- rotation : 5 minutes
- density of bath : 1,04 to 1,07 g/cm³

2)  
addition of 1,5 % sulphuric acid in the form of an aqueous solution concentrated at 10 %
- rotation : 30 minutes
3) addition of 0.7% sodium formiate in the form of an aqueous solution concentrated at 10% 
- rotation : 3 hours 
The pH of the bath obtained is 3.4.

**Impregnation** : rotation speed : 6 to 8 rpm
2% (i.e. 0.16% when expressed as Al₂O₃) of an aqueous solution of aluminium polychlorosulphate presenting a basicity of 55%, a desulphatation rate of 82% and an Al₂O₃ content of 8.3% obtained according to the process described in European patent n°218 487 are added to the bath.
The medium is placed under rotation for 2 hours.
The pH of the bath obtained is 3.6.

**Basification**
0.6% of sodium bicarbonate in the form of an aqueous solution concentrated at 10% is added to the bath.
The medium is placed under rotation for 1 hour and 30 minutes.
The pH of the bath is 4.1.
The B.S.H. skin thereby obtained is spun under low pressure (6 x 10⁵ Pa).
The spun B.S.H. contains :
- 60% of its weight of water
- 10% of its weight (with respect to dry matter in accordance with standard NF-G 52 202) of mineral matter
- 0.80% of its weight (with respect to dry matter) of Al₂O₃
- 85% of its weight (with respect to dry matter) of dermal substances.

Its retraction temperature, measured in accordance with standard NF-G 52 012, is 67°C.
No mould can be observed following storage for 7 weeks at 32/35°C and under 80-85% relative humidity.

**Transformation into wet-blue**
The percentages given below are by weight and calculated with respect to the weight of spun B.S.H. multiplied by 1.5 (to obtain a % equivalent to that expressed with respect to the tripe).
The spun and stored B.S.H. half rump-hides are then slitted to 1.8 mm without any difficulties and subjected to the operations of re-wetting, acidification, tanning and basification in a fuller similar to that described above.
- **re-wetting** : rotation speed = 6 to 8 rpm
  - cold water (16-18°C) = 10%
  - rotation : 10 minutes then drip-drying
Acidification: rotation speed = 6 to 8 rpm
- cold water (16-18°C) = 40 %
- NaCl = 4 %
- rotation : 10 minutes
- pH of bath = 4,0
- density of bath : 1,04 to 1,07 g/cm³

Then addition of 0,5 % sulphuric acid in the form of an aqueous solution concentrated at 10 %
rotation : 20 minutes
The pH of the bath obtained is of 3,2.

Tanning: rotation speed = 8 to 10 rpm
8 % of chromium sulphate in the form of an aqueous solution concentrated at 25 % are added

to the bath
rotation : 6 hours
The pH of the bath obtained is of 3,2 to 3,3.

Basification: rotation speed = 8 to 10 rpm
The following are added to the bath:
- 0,5 % of sodium bicarbonate in the form of an aqueous solution concentrated at 10 %
  rotation : 15 minutes, the pH obtained is of 3,6
- then again 0,5 % of sodium bicarbonate in the form of an aqueous solution concentrated
  at 10 %
  rotation : 60 minutes, the pH obtained is of 3,9.

The wet-blue obtained are unloaded and hung on clothes-horse.

Transformation of the wet-blue into stain
The percentages given below are calculated with respect to the weight of blue.
The ex B.S.H half rump-hides tanned with chromium during the preceding operation undergo
the following operations:
  - washing: rotation speed = 8 to 10 rpm
    - cold water (16-18°C) : 150 %
    - rotation 5 minutes then drip-drying
  - retannin-neutralization: rotation speed = 8-10 rpm
    - water at 35°C : 100 %
    - SYNEKTAN N.C.R. (organometallic tannin commercialised by ICI) : 4 %
    - rotation : 30 minutes

Then, addition of 2 % NEUTRAKTAN D (neutralizing agent commercialised by ICI)
  - rotation : 1 hour
The pH of the bath obtained is of 5.4. Following drip-drying, the product is washed with 100% water at 40°C:
- rotation: 5 minutes

5 Retanning: Rotation speed = 8 to 10 rpm
- water at 40°C: 50%
- ALBATAN SF (synthetic tannin commercialised by RHONE-POULENC): 8%
- rotation: 45 minutes then drip-drying

1.0 Feed: rotation speed = 6 to 10 rpm
- water at 60°C: 50%
- Lipoderm-licker PK (sulphated oil of animal origin commercialised by BASF): 6%
- rotation: 45 minutes

1.5 The stains obtained are unloaded and hung on clothes-horse for 24 hours. Following spinning and drying, it is established that the product obtained contain 0.132% of fixed Al₂O₃ (expressed with respect to dry matter). The B.S.H itself contained 0.80% of Al₂O₃, expressed with respect to dry matter. It can therefore be established that the major fraction of Al₂O₃ has been eliminated through displacement by tanning agents during transformation into wet-blue and into stain; this is due to the property of reversibility of the B.S.H.

2.0 EXAMPLE 2
The operations of pickling, impregnation and basification described in Example 1 are repeated, performing the impregnation with 2.2% of aqueous solution of basic aluminium polychlorosulphate. Following 2 hours of rotation 1.1% acrylic acid, expressed with respect to the weight of tripe, is added. Following 2 hours of rotation, the medium is basified as previously described to a pH of 4. No mould is present following storage for 11 weeks at 32/35°C and under 80/85% relative humidity.
THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. Colorless wet pelts, biologically stable, untanned, completely chromium-free, containing from 50 to 70 % of water, by weight, from 5 to 30 % of total mineral matter by weight with respect to the dry and degreased leather, from 0,5 to 1,5 % of Al₂O₃ by weight with respect to the dry and degreased leather and from 85 to 90 % of dermal substances by weight with respect to the dry and degreased leather, wet pelts characterised in that they are intrinsically insensitive to moulds without addition of supplementary fungicides and bacteriostatic agents.

2. Wet pelts according to claim 1) characterised in that they contain from 55 to 65 % of water, by weight, from 7 to 12 % of total mineral matter, by weight and less than 1 % of Al₂O₃, by weight.

3. Preparation process of the wet pelts subject of claims 1 and 2 by Impregnation of pickled pelts at a pH of the order of 3 to 4 by means of a bath based on basic aluminium polychloride or on a basic aluminium polychlorosulphate in an amount corresponding to 0,08 to 0,45 % of Al₂O₃ by weight with respect to the weight of panels in triplicate, followed by basification to a final pH of the order of 4 to 4,4 and by optional spinning.

4. Process according to claim 3) characterised in that the pH is of the order of 3,5 to 3,8 and the quantity of Al₂O₃ of the order of 0,10 to 0,25 %.

5. Process according to claim 3 or 4 characterised in that the formula of the basic aluminium polychloride or polychlorosulphate is as follows:

- \[ Al_n (OH)_m Cl_{3n-m} \] (I)
  where n and m are any positive integer with 3n-m positive

- \[ Al (OH)_m O_{3-m-2n} (SO_4)_{n} \] (II)
  where m is included between 1,1 and 2,1 ; n between 0,12 and 0,18 ; its basicity is included between 0,37 and 0,70.

- \[ Al_n (OH)_m Cl_{3n-m-2k} (SO_4)_k \] (III)
  where k, m and n are positive integers with 3n > m + 2k and k/n = 0,01 to 0,3 ; its basicity m/3n is included between 0,3 and 0,7.

- \[ Al_n (OH)_{3n-2m+2p} Cl_m (SO_4)_{p} \] z \] (IV)
  where (3n-2m-p)/3n = 0,4 to 0,7 ; p = 0,04 to 0,25 n ; m/p = 8 to 35, m, n and p being integers and z being equal to at least 1.

- \[ Al_n (OH)_m (SO_4)_k Cl_{3n-2m} \] (V)
where basicity \( m/\text{n} \) is included between 0.40 and 0.65, the ratio \( \text{Al equivalent/Cl equivalent} \) is included between 2.8 and 5, the mean molecular mass by weight \( M_w \) ranging from 10 000 to 500 000, the true hydrodynamic diameters \( \phi_Z \) and \( \phi_W \) having the following values:

\[
\begin{align*}
\phi_Z (\text{A}) & \text{ from } 90 \text{ to } 450, \\
\phi_W (\text{A}) & \text{ from } 50 \text{ to } 300.
\end{align*}
\]

6. Process according to any one of claims 3 to 5) characterised in that the bath contains, in addition, from 0.5 to 5 % by weight with respect to the weight of tripe of a vinylic acid and/or from 0.02 to 1.25 % by weight with respect to the weight of tripe of a rare earth vinylic salt.

7. Process according to claim 6) characterised in that the vinylic acid is acrylic acid and the rare earth salt is lanthanum acrylate.

8. Utilization of the wet pelts which are subject of claim 1 or 2 for the preparation of tanned, semi-worked or finished pelts.

9. A process for the preparation of wet pelts substantially as herein described with reference to the Examples.

DATED this 25th Day of July, 1990

RHONE-POULENC CHIMIE

Author: L'INPI

The Institute of Atomic Energy
of Indraylicko

of Indraylicko