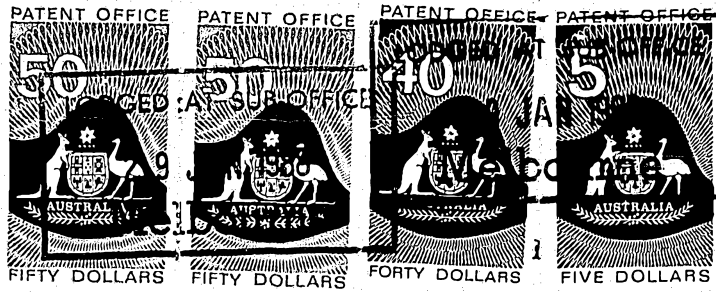


(NON-CONVENTION. B.



Form 1.

Patents Act 1952-1969

LODGED AT SUB-OFFICE  
29 JAN 1988  
Melbourne

599201  
APPLICATION FOR A PATENT

FEE STAMP TO VALUE OF  
\$145 ATTACHED  
MAIL OFFICER *ma*

(1) Here insert (in full) Name or Names of Applicant or Applicants, followed by Address (es).

xk (1) BASF AKTIENGESELLSCHAFT  
We  
OF D-6700 Ludwigshafen, Federal Republic of Germany

(2) Here insert Title of Invention.

hereby apply for the grant of a Patent for an invention entitled: (2)  
PREPARATION OF PROPYLENE/ETHYLENE POLYMERS

ALLOWED 2.5.90

which is described in the accompanying ~~PROVISIONAL~~ COMPLETE specification.

XXMY  
Our address for service is Messrs. Edwd. Waters & Sons, Patent Attorneys,  
50 Queen Street, Melbourne, Victoria, Australia.

DATED this 28th day of January 19 88

(3) Signature (s) of Applicant (s) or Seal of Company and Signatures of its Officers as prescribed by its Articles of Association.

(3)

BASF AKTIENGESELLSCHAFT  
by *Louis C. Gebhardt*  
Louis C. Gebhardt  
Registered Patent Attorney

COMMONWEALTH of AUSTRALIA

Patents Act 1952-1960

DECLARATION IN SUPPORT OF AN APPLICATION FOR A PATENT OR PATENT OF ADDITION

LODGED AT SUB-OFFICE 29 JAN 1988 Melbourne

(1) Here insert (in full) Name of Company.

In support of the Application made by(1) BASF Aktiengesellschaft a German Joint Stock Company of 6700 Ludwigshafen, Federal Republic of Germany,

(2) Here insert title of Invention.

for a Patent.....for an invention entitled:(2) "PREPARATION OF PROPYLENE/ETHYLENE POLYMERS"

(3) Here insert full Name and Address, of Company Official authorized to make declaration.

We, (3) Dr. KARL-FRIEDRICH BANGERT and PETER BARZ, citizens of the Federal Republic of Germany, residing, respectively, at 6 Heidenhainstrasse, 6520 Worms; and 20 Hochfeldstrasse, 6700 Ludwigshafen; Federal Republic of Germany;

do solemnly and sincerely declare as follows:

We are

1. ~~KRM~~ authorized by(1) BASF AKTIENGESELLSCHAFT

the applicant for the patent.....to make this declaration on its behalf.

(4) Here insert (in full) Name and Address of Actual Inventor or Inventors.

2. (4) OSKAR BUECHNER and WOLFGANG GRUBER, citizens of the Federal Republic of Germany, residing, respectively, at 4 Sickingenstrasse, 6724 Dudenhofen; and 2b Lorscher Ring, 6710 Frankenthal; Federal Republic of Germany;

XXX are

the actual inventors of the invention and the facts upon which(1).....

BASF AKTIENGESELLSCHAFT

is entitled to make the application, are as follow:

The said(1) BASF Aktiengesellschaft

(5) Full Name of Actual Inventor or Inventors

is the assignee of the said(5) OSKAR BUECHNER and

WOLFGANG GRUBER

Paragraph 2 should be completed by showing devolution of title, e.g., "The said (Name of applicant) is the assignee of the said (Name of

DECLARED at 6700 Ludwigshafen, Federal Republic of Germany,...

this 21st day of January 19 88

(12) PATENT ABRIDGMENT (11) Document No. AU-B-11104/88  
(19) AUSTRALIAN PATENT OFFICE (10) Acceptance No. 599201

(54) Title  
PREPARATION OF PROPYLENE/ETHYLENE POLYMERS USING THREE REACTION ZONES, ONE PRODUCING POLYPROPYLENE, ONE POLYETHYLENE AND THE THIRD A COPOLYMER OF ETHYLENE AND PROPYLENE

International Patent Classification(s)  
(51)<sup>4</sup> C08F 255/02

(21) Application No. : 11104/88

(22) Application Date : 29.01.88

(43) Publication Date : 03.08.89

(44) Publication Date of Accepted Application : 12.07.90

(71) Applicant(s)  
BASF AKTIENGESELLSCHAFT

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OSKAR BUECHNER; WOLFGANG GRUBER

(74) Attorney or Agent  
WATERMARK MELBOURNE

(56) Prior Art Documents  
AU 32253/78 C08F 255/02  
AU 47688/85 C08F 210/06  
EP 276734

(57) Claim

1. A process for the preparation of propylene/ethylene polymers, in which first

(A) in a first polymerization zone, propylene is homopolymerized in the presence of hydrogen as a molecular weight regulator, in a stirred bed of finely divided polymer and in the absence of a liquid reaction medium, from the gas phase, by feeding in a Ziegler-Natta catalyst system consisting of

- (1) a titanium catalyst component and
- (2) an organoaluminum catalyst component of the formula  $ALR_m X_{3-m}$ , where X is OR, chlorine, bromine or hydrogen, R is a  $C_1-C_{18}$ -hydrocarbon radical and m is from 1 to 3,
- (3) with or without a further catalyst component, with the provisos that, in this first polymerization zone (i) the reaction is carried out under a total pressure of from 20 to 35 bar and at from 60 to 90°C and (ii) the ratio of the propylene partial pressure to the hydrogen partial pressure is from 100:0.1 to 100:15, and then

(B) in a second polymerization zone, a mixture of propylene and ethylene is polymerized with the propylene homopolymer obtained in the first polymerization zone in the presence of

(11) AU-B-11104/88  
(10) 599201

-2-

hydrogen as a molecular weight regulator, in a stirred bed of finely divided polymer and in the absence of a liquid reaction medium from the gas phase, by feeding in the reaction products obtained in the first polymerization zone (A) and in the further polymerization zone (C), with or without additional catalyst component (2), with the provisions that, in this second polymerization zone (i) the reaction is carried out under a total pressure of from 10 to 20 bar and at from 50 to 80°C, (ii) the ratio of the propylene partial pressure to the ethylene partial pressure is from 100:10 to 100:70 and the ratio of the propylene partial pressure to the hydrogen partial pressure is from 100:2 to 100:70, and (iii) the ratio of the weight of the propylene converted to polymer in the first polymerization zone (A) to the weight of the propylene/ethylene mixture converted to polymer in the second polymerization zone (B) is from 100:10 to 100:60,

wherein in addition

(C) in a further polymerization zone, ethylene is homopolymerized in the presence or absence of hydrogen as a molecular weight regulator, in a stirred bed of finely divided polymer and in the absence of a liquid reaction medium, from the gas phase, by means of Ziegler or Phillips catalysis, with the provisos that, in this further polymerization zone, (i) the reaction is carried out under a total pressure of from 20 to 45 bar and at from 80 to 120°C, (ii) where relevant, the ratio of the ethylene partial pressure to the hydrogen partial pressure is from 100:0.01 to 100:20 and (iii) the ratio of the weight of the propylene converted to polymer in the first polymerization zone (A) to the weight of the ethylene converted to polymer in the further polymerization zone (C) is from 100:5 to 100:40, and the resulting reaction product is likewise fed to the second polymerization zone (B).

599201<sup>10</sup>

COMMONWEALTH OF AUSTRALIA  
PATENTS ACT 1952-69

COMPLETE SPECIFICATION  
(ORIGINAL)

Application Number: \_\_\_\_\_ Class \_\_\_\_\_ Int. Class \_\_\_\_\_  
Lodged: \_\_\_\_\_

Complete Specification Lodged: \_\_\_\_\_  
Accepted: \_\_\_\_\_  
Published: \_\_\_\_\_

Priority: \_\_\_\_\_

Related Art: \_\_\_\_\_

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Name of Applicant: BASF AKTIENGESELLSCHAFT

Address of Applicant: D-6700 Ludwigshafen, Federal Republic of Germany

Actual Inventor: OSKAR BUECHNER and WOLFGANG GRUBER

Address for Service: EDWD. WATERS & SONS,  
50 QUEEN STREET, MELBOURNE, AUSTRALIA, 3000.

Complete Specification for the invention entitled:

PREPARATION OF PROPYLENE/ETHYLENE POLYMERS

The following statement is a full description of this invention, including the best method of performing it known to: US

Preparation of propylene/ethylene polymers

The present invention relates to a process for the preparation of propylene/ethylene polymers, in which first

- 5 (A) in a first polymerization zone, propylene is homopolymerized in the presence of hydrogen as a molecular weight regulator, in a stirred bed of finely divided polymer and in the absence of a liquid reaction medium, from the gas phase, by feeding in a Ziegler-Natta catalyst system consisting of
- 10 (1) a titanium catalyst component and  
(2) an organoaluminum catalyst component of the formula  $AlR_mX_{3-m}$ , where X is OR, chlorine, bromine or hydrogen, R is a C<sub>1</sub>-C<sub>18</sub>-hydrocarbon radical and
- 15 m is from 1 to 3,  
(3) with or without a further catalyst component, with the provisos that, in this first polymerization zone (i) the reaction is carried out under a total pressure of from 20 to 35 bar and at from 60 to 90°C and (ii) the ratio of the propylene partial pressure to the hydrogen partial pressure is from 100:0.1 to 100:15, and then
- 20 (B) in a second polymerization zone, a mixture of propylene and ethylene is polymerized with the propylene homopolymer present in the reaction product obtained in the first polymerization zone in the presence of hydrogen as a molecular weight regulator, in a stirred bed of finely divided polymer and in the absence of a liquid reaction medium, from the gas phase, by feeding in the reaction
- 30 product obtained in the first polymerization zone, with or without additional catalyst component (2), with the provisos that, in this second polymerization zone (i) the reaction is carried out under a total pressure of from 10 to 20 bar and at from 50 to 80°C, (ii) the ratio of the propylene partial pressure to the ethylene partial
- 35 pressure is from 100:10 to 100:70 and the ratio of the propylene partial pressure to the hydrogen partial pressure is from 100:2 to 100:70, and (iii) the ratio of the weight

of the propylene converted to polymer in the first polymerization zone (A) to the weight of the propylene/ethylene mixture converted to polymer in the second polymerization zone (B) is from 100:10 to 100:60.

5           Processes of this type have been disclosed in a number of variants, and reference may be made, for example, to US Patent 4,454,299 and South African Patents 0084/3561, 0084/3563 and 0084/5261 as typical publications.

10           The known processes of the type under discussion and in particular the resulting products have in general proven useful in industry, including, for example, automotive construction; however, they are still unsatisfactory in one respect or another. For example, it has to date been  
15 impossible to obtain polymers having a very advantageous balance of rigidity, toughness at room temperature and low temperature impact strength, ie. polymers which are particularly suitable for automotive construction, for example as material for bumpers or instrument panels. The  
20 production of such polymers is a worthwhile aim.

          It is an object of the present invention to modify the process defined at the outset so that it permits polymers having the abovementioned property spectrum to be prepared in an advantageous manner.

25           We have found that this object is achieved if, in the process in question, ethylene is homopolymerized in a further polymerization zone (C) from the gas phase, with certain provisos, and the resulting reaction product is likewise fed to this second polymerization zone  
30 (B).

          The present invention accordingly relates to a process for the preparation of propylene/ethylene polymers, in which first  
35 (A) in a first polymerization zone, propylene is homopolymerized in the presence of hydrogen as a molecular weight regulator, in a stirred bed of finely divided

polymer and in the absence of a liquid reaction medium, from the gas phase, by feeding in a Ziegler-Natta catalyst system consisting of

- (1) a titanium catalyst component and
- 5 (2) an organoaluminum catalyst component of the formula  $AlR_mX_{3-m}$ , where X is OR, chlorine, bromine or hydrogen, R is a C<sub>1</sub>-C<sub>18</sub>-hydrocarbon radical and m is from 1 to 3,

- (3) with or without a further catalyst component,
- 10 with the provisos that, in this first polymerization zone (i) the reaction is carried out under a total pressure of from 20 to 35 bar and at from 60 to 90°C and (ii) the ratio of the propylene partial pressure to the hydrogen partial pressure is from 100:0.1 to
- 15 100:15, and then

(B) in a second polymerization zone, a mixture of propylene and ethylene is polymerized with the propylene homopolymer present in the reaction product obtained in the first polymerization zone in the presence of hydrogen as a molecular weight regulator, in a stirred bed of finely divided polymer and in the absence of a liquid reaction medium, from the gas phase, by feeding in the reaction product obtained in the first polymerization zone, with or without additional catalyst component (2), with the provisos that, in this second polymerization zone (i) the

20 reaction is carried out under a total pressure of from 10 to 20 bar and at from 50 to 80°C, (ii) the ratio of the propylene partial pressure to the ethylene partial pressure is from 100:10 to 100:70 and the ratio of the propylene partial pressure to the hydrogen partial pressure is from

25 100:2 to 100:70, and (iii) the ratio of the weight of the propylene converted to polymer in the first polymerization zone (A) to the weight of the propylene/ethylene mixture converted to polymer in the second polymerization zone (B) is from 100:10 to 100:60.

35 In the process according to the invention, in addition,



(C) in a further polymerization zone, ethylene is homopolymerized in the presence or absence of hydrogen as a molecular weight regulator, in a stirred bed of finely divided polymer and in the absence of a liquid reaction medium, from the gas phase, by means of Ziegler or Phillips catalysis, with the provisos that, in this further polymerization zone, (i) the reaction is carried out under a total pressure of from 20 to 45 bar and at from 80 to 120°C, (ii) where relevant, the ratio of the ethylene partial pressure to the hydrogen partial pressure is from 100:0.01 to 100:20 and (iii) the ratio of the weight of the propylene converted to polymer in the first polymerization zone (A) to the weight of the ethylene converted to polymer in the further polymerization zone (C) is from 100:5 to 100:40, and the resulting reaction product is likewise fed to the second polymerization zone (B).

Regarding the novel process, the following may be stated specifically:

Provided that the defining feature is taken into account, the polymerization process as such can be carried out in relevant conventional technological embodiments, in particular as a cyclic continuous process. The stated technological embodiments, ie. the technological variants of gas phase block copolymerization, are discussed in sufficient detail in the publications cited at the outset to make further description unnecessary here.

However, for completeness, it should be mentioned that, in the process according to the invention, the form of the further polymerization zone (C) and the procedure in this zone are in the general sense similar to the form of the first polymerization zone (A) and the procedure in this zone; furthermore, in these two polymerization zones, it is advantageous if the total pressure in each of these zones is detectably (ie. 5 bar or more) higher than the total pressure in the second polymerization zone (B).

Regarding the composition of the catalyst systems to be used in the novel process, the following may be

stated specifically:

Titanium catalyst component (1):

5 The relevant conventional components are suitable here, especially those which give very uniformly round, readily free-flowing polymer particles; the following two groups which are particularly suitable for the novel process being noteworthy: (i) finely divided titanium trichloride cocrystallization product of the formula  $TiCl_3 \cdot 1/3 AlCl_3$  and (ii) finely divided cocrystallization  
10 product of the formula  $TiCl_3 \cdot 1/3 AlCl_3$  which is modified with electron donors or Lewis bases and have ethers or esters as modifiers, and reaction products of magnesium compounds with titanium halides with the addition of specific esters or anhydrides. Titanium catalyst  
15 components of this type are sufficiently well known from the literature (cf. for example the publications cited at the outset) and in practice that no further description is required.

Organoaluminum catalyst components (2):

20 Suitable organoaluminum catalyst components are once again the relevant conventional ones; they are likewise sufficiently well known from literature and in practice that no further description is required. Triethylaluminum and diethylaluminum chloride are typical examples.  
25

Further catalyst components (3) which may or may not be used:

30 The relevant conventional components, in particular phenolic substances and silane compounds, are suitable in this case too; they are likewise sufficiently well known from the literature and in practice that no further description is required here.

The Ziegler and Phillips catalysts and catalyst systems for ethylene homopolymerization:

35 The relevant conventional ones are again suitable in this case, especially those which give very uniformly

round, readily free-flowing polymer particles; these catalysts and catalyst systems too are sufficiently well known that no further description is required here.

5 In general, it may therefore be stated that the substances used in the novel process as such are the relevant conventional ones and have no special features.

EXAMPLE 1

The process is carried out by a cyclic continuous procedure in a kettle cascade consisting of three stirred  
10 kettles, each having a useful volume of 200 l; the kettles are connected in a V shape: both a kettle for the preparation of the propylene homopolymer (first polymerization zone A) and a kettle for the preparation of the ethylene homopolymer (further polymerization zone C) are  
15 upstream from the kettle for the preparation of the end product (second polymerization zone B).

The propylene/ethylene polymer is prepared by a procedure in which, first,  
20 (A) in the first polymerization zone, propylene is homopolymerized in the presence of hydrogen as a molecular weight regulator, in a stirred bed of finely divided polypropylene and in the absence of a liquid reaction medium, from the gas phase, by feeding in a Ziegler-Natta catalyst system consisting of

- 25 (1) a titanium(III) component of the formula  
 $TiCl_3 \cdot 1/3 AlCl_3 \cdot 1/3 n\text{-propyl benzoate}$ ,  
(2) diethylaluminum chloride and  
(3) n-octadecyl  $\beta$ -(4'-hydroxy-3',5'-di-tert-butylphenyl)-propionate  
30 (with the proviso that the atomic ratio of titanium from the titanium(III) component (1) to aluminum from the diethylaluminum chloride (2) is 1:6 and the molar ratio of diethylaluminum chloride (2) to the further catalyst component (3), ie. the n-octadecyl  $\beta$ -(4'-hydroxy-3',5'-di-tert-butylphenyl)propionate, is 1:0.04)

35 with the provisos that, in the first polymerization zone,  
(i) the reaction is carried out under a total pressure

of 28 bar and at 70°C and (ii) the ratio of the propylene partial pressure to the hydrogen partial pressure is 100:2, and then

(B) in a second polymerization zone, a propylene/ethylene mixture is polymerized with the propylene homopolymer present in the reaction product obtained in the first polymerization zone, in the presence of hydrogen as a molecular weight regulator, in a stirred bed of finely divided polymer and in the absence of a liquid reaction medium, from the gas phase, by feeding in the reaction product obtained in the first polymerization zone, and additional catalyst component (2) in an amount such that the atomic ratio of titanium from the titanium(III) component (1) to aluminum from the additional diethylaluminum chloride (2) is 1:4, with the provisos that, in this second polymerization zone, (i) the reaction is carried out under a total pressure of 15 bar and at 55°C, (ii) the ratio of the propylene partial pressure to the ethylene partial pressure is 100:35 and the ratio of the propylene partial pressure to the hydrogen partial pressure is 100:38 and (iii) the ratio of the weight of the propylene converted to polymer in the first polymerization zone (A) to the weight of the propylene/ethylene mixture converted to polymer in the second polymerization zone (B) is 100:30.

According to the invention, in addition (C) in a further polymerization zone, ethylene is homopolymerized in a stirred bed of finely divided polyethylene in the absence of a liquid reaction medium, from the gas phase, by means of a commercial Phillips catalyst (2% of CrO<sub>3</sub> on SiO<sub>2</sub>, activated at 900°C in a stream of air), with the provisos that, in this further polymerization zone (i) the reaction is carried out under a total pressure of 35 bar and at 108°C and (ii) the ratio of the weight of the propylene converted to polymer in the first polymerization zone (A) to the weight of the ethylene converted to polymer in the further polymerization zone

(C) is 100:17, and the resulting reaction product is likewise fed to the second polymerization zone (B).

The propylene/ethylene polymer thus obtained (26.5 kg/h) is dechlorinated, stabilized and granulated in an extruder in a conventional manner; it has a very advantageous balance of rigidity, toughness at room temperature and low temperature impact strength.

EXAMPLE 2

The process is carried out by a cyclic continuous procedure in a kettle cascade consisting of three stirred kettles, each having a useful volume of 200 l; the kettles are connected in a V shape: both a kettle for the preparation of the propylene homopolymer (first polymerization zone A) and a kettle for the preparation of the ethylene homopolymer (further polymerization zone C) are upstream from the kettle for the preparation of the end product (second polymerization zone B).

The propylene/ethylene polymer is prepared by a procedure in which, first (A) in the first polymerization zone, propylene is homopolymerized in the presence of hydrogen as a molecular weight regulator, in a stirred bed of finely divided polypropylene and in the absence of a liquid reaction medium, from the gas phase, by feeding in a Ziegler-Natta catalyst system consisting of

- (1) a titanium catalyst component prepared according to the Example of German Laid-Open Application DOS 3,428,478,
  - (2) triethylaluminum and
  - (3) triethoxyphenylsilane
- (with the proviso that the atomic ratio of titanium from the titanium catalyst component (1) to aluminum from the triethylaluminum (2) is 1:150 and the molar ratio of triethylaluminum (2) to further catalyst component (3) ie. the triethoxyphenylsilane, is 1:0.1)
- with the provisos that, in the first polymerization zone, (i) the reaction is carried out under a total pressure

of 28 bar and at 70°C and (ii) the ratio of the propylene partial pressure to the hydrogen partial pressure is 100:0.2, and then

(B) in a second polymerization zone, a propylene/ethylene mixture is polymerized with the propylene homopolymer present in the reaction product obtained in the first polymerization zone, in the presence of hydrogen as a molecular weight regulator, in a stirred bed of finely divided polymer and in the absence of a liquid reaction medium, from the gas phase, by feeding in the reaction product obtained in the first polymerization zone, with the provisos that, in the second polymerization zone, (i) the reaction is carried out under a total pressure of 13 bar and at 50°C, (ii) the ratio of the propylene partial pressure to the ethylene partial pressure is 100:20 and the ratio of the propylene partial pressure to the hydrogen partial pressure is 100:10, and (iii) the ratio of the weight of the propylene converted to polymer in the first polymerization zone (A) to the weight of the propylene/ethylene mixture converted to polymer in the second polymerization zone (B) is 100:40.

According to the invention, in addition

(C) in a further polymerization zone, ethylene is homopolymerized in a stirred bed of finely divided polyethylene in the absence of a liquid reaction medium, from the gas phase, by means of a Ziegler catalyst as described in Example 1 of German Laid-Open Application DOS 2,543,272, with the provisos that, in this further polymerization zone (i) the reaction is carried out under a total pressure of 30 bar and at 104°C and (ii) the ratio of the weight of the propylene converted to polymer in the first polymerization zone (A) to the weight of the ethylene converted to polymer in the further polymerization zone (C) is 100:26, and the resulting reaction product is likewise fed to the second polymerization zone (B).

The propylene/ethylene polymer thus obtained



THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A process for the preparation of propylene/ethylene polymers, in which first

(A) in a first polymerization zone, propylene is homopolymerized in the presence of hydrogen as a molecular weight regulator, in a stirred bed of finely divided polymer and in the absence of a liquid reaction medium, from the gas phase, by feeding in a Ziegler-Natta catalyst system consisting of

(1) a titanium catalyst component and

(2) an organoaluminum catalyst component of the formula

$ALR_m X_{3-m}$ , where X is OR, chlorine, bromine or hydrogen, R is a  $C_1-C_{18}$ -hydrocarbon radical and m is from 1 to 3,

(3) with or without a further catalyst component, with the provisos that, in this first polymerization zone (i) the reaction is carried out under a total pressure of from 20 to 35 bar and at from 60 to 90°C and (ii) the ratio of the propylene partial pressure to the hydrogen partial pressure is from 100:0.1 to 100:15, and then

(B) in a second polymerization zone, a mixture of propylene and ethylene is polymerized with the propylene homopolymer obtained in the first polymerization zone in the presence of hydrogen as a molecular weight regulator, in a stirred bed of finely divided polymer and in the absence of a liquid reaction medium from the gas phase, by feeding in the reaction products obtained in the first polymerization zone (A) and in the further polymerization zone (C), with or without additional catalyst component (2), with the provisions that, in this second polymerization zone (i) the reaction is carried out under a total pressure of from 10 to 20 bar and at from 50 to 80°C, (ii) the ratio of the propylene partial pressure to the ethylene partial pressure is from 100:10 to 100:70 and the ratio of the propylene partial pressure to the hydrogen partial pressure is from 100:2 to 100:70, and (iii) the ratio of the weight of the propylene converted to polymer in the first polymerization





zone (A) to the weight of the propylene/ethylene mixture converted to polymer in the second polymerization zone (B) is from 100:10 to 100:60,

wherein in addition

(C) in a further polymerization zone, ethylene is homopolymerized in the presence or absence of hydrogen as a molecular weight regulator, in a stirred bed of finely divided polymer and in the absence of a liquid reaction medium, from the gas phase, by means of Ziegler or Phillips catalysis, with the provisos that, in this further polymerization zone, (i) the reaction is carried out under a total pressure of from 20 to 45 bar and at from 80 to 120°C, (ii) where relevant, the ratio of the ethylene partial pressure to the hydrogen partial pressure is from 100:0.01 to 100:20 and (iii) the ratio of the weight of the propylene converted to polymer in the first polymerization zone (A) to the weight of the ethylene converted to polymer in the further polymerization zone (C) is from 100:5 to 100:40, and the resulting reaction product is likewise fed to the second polymerization zone (B).

DATED this 28th day of January 1988.

BASF AKTIENGESELLSCHAFT

EDWD. WATERS & SONS  
PATENT ATTORNEYS  
50 QUEEN STREET  
MELBOURNE. VIC.