cessively peeled off from the surface of the carrier, causing the catalytic metals carried to peel off from the surface of the coated layer on the carrier. Therefore, such a catalyst is not suitable for purifying exhaust gases from automobile engines.

Moreover, it is preferable that the alumina sol is prefared by using alumina whose starting material is boehmite, and the starting material of the activated alumina is boehmite to improve adhesion of the coating layer on the surface of the carrier. In this connection, if the starting material of the activated alumina is gibbsite while the alumina sol is prepared by using alumina whose starting material is boehmite, the coating layer may be liable to peel off from the surface of the carrier.

(5) Determination of Activity of Catalysts on Actual Automobile Engine

Each of three catalysts having the carriers prepared by using Samples (a), (f) and (l) shown in Table 1 as activated alumina was mounted at its position of the exhaust system of an automobile engine of 4-cylinder type having a displacement of 2 liters. Then, the engine was controlled to be operated to expose the catalyst to the exhaust gases of the engine for about 127.5 hours under conditions in which the inlet gas temperature of the catalyst was 950±5° C., the gas hourly space velocity (GHSV) was 130,000 hr^{-1}, the inlet gas composition of the catalyst was 0.01–0.05 Vol% CO; 14.5–14.8 Vol% CO_2; 100–200 ppm hydrocarbons (HC).

After exposed to the exhaust gases under the above-mentioned condition, the activity of the catalysts was evaluated on an automobile engine of 4-cylinder type having a displacement of 1.8 liters under conditions in which the gas hourly space velocity of the exhaust gases was 56,000 hr^{-1}, the inlet gas temperature of the catalyst was 150°–400° C. in which the increasing rate of temperature was 5°–7° C. per minute, the inlet gas composition was 0.76±0.04 vol% CO; 11.1±0.15 vol% CO_2; 1920±95 ppm hydrocarbons; and 1850±140 ppm NO. The evaluation of the activity was carried out by measuring particular temperature at which CO and hydrocarbons in the exhaust gases were converted by 50 vol% and the conversion efficiencies of CO and hydrocarbons at 400° C. to obtain Table3.

As seen from Table 3, the catalyst having the carrier prepared by using Sample (a) shown in Table 1 is excellent both in the temperature at which CO and hydrocarbons are converted by 50 Vol% and in the conversion efficiency at 400° C. Therefore, Table 3 demonstrates that the catalyst prepared by using activated alumina (before being coated on the carrier) containing not less than 60 Wt% of delta-alumina is excellent even when mounted on the exhaust system of automobile engines, as compared with other catalysts prepared by using activated alumina (before being coated) containing less than 60 Wt% of delta-alumina.

TABLE 3

Samples	CO		HC	
	T_{50}(°C.)	n_{400}(%)	T_{50}(°C.)	n_{400}(%)
(a)	272	98.7	278	83.7
(f)	not less than 400	47	386	57
(l)	328	98.0	333	79.3

Note:
T_{50} = the temperature (°C.) at which a component gas is converted by 50 vol%.
n_{400} = the conversion efficiency (%) of a component gas at 400° C.

What is claimed is:

1. A method for forming a high surface area coating on the surface of a monolithic catalyst carrier, said method comprising the steps of:
   preparing a mixture containing not more than 20 parts by weight of alumina sol and one part by weight of activated alumina, said alumina sol containing 3 to 15 Wt % of alumina, said activated alumina containing not less than 60 Wt % of delta-alumina;
   coating said mixture onto the surface of the catalyst carrier;
   drying the coated catalyst carrier; and
   firing the coated catalyst carrier at a temperature in the range of 150° to 850° C. for a time in the range of from 0.5 to 20 hours to form the high surface area coating on the surface of the catalyst carrier.

2. A method as claimed in claim 1, in which said alumina sol is prepared by using alumina whose starting material is boehmite, and the starting material of said activated alumina is boehmite.

3. A method as claimed in claim 2, further comprising the step of applying an acid or an alkali onto the surface of the catalyst carrier before coating said mixture onto the surface of the same.

4. A method as claimed in claim 3, further comprising the step of gelling said alumina sol in said mixture by applying an acid or an alkali after coating said mixture onto the surface of the catalyst carrier.

5. A method as claimed in claim 2, wherein said temperature is in the range of 300° to 700° C.

6. A method as claimed in claim 5, wherein said time is in the range of from 1 to 5 hours.

7. A method for preparing a catalyst for purification of a high temperature waste gas, comprising the steps of:
   preparing a mixture containing not more than 20 parts by weight of an alumina sol and one part by weight of activated alumina, said alumina sol containing 3 to 15 Wt% of alumina, said activated alumina containing not less than 60 Wt % of delta-alumina;
   coating said mixture onto the surface of the catalyst carrier;
   drying the coated catalyst carrier;
   firing the coated catalyst carrier at a temperature in the range of 150° to 850° C. for a time in the range of from 0.5 to 20 hours; and
   immersing the fired coated catalyst carrier in a solution containing a noble metal.

8. A method as claimed in claim 7, wherein said alumina sol is prepared by using alumina whose starting material is boehmite, and the starting material of said activated alumina is boehmite.

9. A method for preparing a catalyst for purification of exhaust gases discharged from automobile engines, said method comprising the steps of:
   preparing a mixture containing not more than 20 parts by weight of an alumina sol and one part by weight of activated alumina, said alumina sol containing 3 to 15 Wt % of alumina, said activated alumina containing not less than 60 Wt % of delta-alumina;
   coating said mixture onto the surface of the catalyst carrier;
   drying the coated catalyst carrier;