

luted with water to a SiO₂ concentration of 8.5% by weight. The diluted water glass was poured with stirring into 15 wt.% sulfuric acid to prepare silica sols having pH of 1.9 and 6.0 respectively. Chromium oxide (Cr₂O₃) having an average particle size of 1 μ was added to each sol in an amount of 2 wt.% based on the weight of SiO₂ in the sol, stirred to effect uniform dispersion and heated to 60°C for gelation to obtain a hydrosilica gel. The gel obtained was washed with water and dried at 200°C for 10 hours to obtain a silica gel. The silica gels thus prepared had a bulk density of about 0.8 g/cm³ and a specific surface area of 650 m²/g and contained 1.5% and 1.7% by weight of water-soluble components (Glauber's salt) respectively. A portion of each of the silica gels passing through a 10-mesh screen but retained on a 20-mesh screen was pre-fired at 700°C for 30 minutes and further fired in a rotary kiln at 1400°C for 6 minutes to obtain a foamed product. The properties of the foamed product are given in Table 1 below.

COMPARISON EXAMPLE 1

A foamed product was obtained in the same manner as in Example 1 except that silica sol having pH of 8.5 was prepared and subjected to gelation to produce hydrosilica gel. The properties of the foamed product are shown in Table 1 below.

COMPARISON EXAMPLE 2

A silica sol having pH of 3.0 was prepared in the same manner as in Example 1 and the sol was subjected in the same manner as in Example 1 except that chromium oxide was not added thereto. The resultant dried silica gel was fired in the same manner as in Example 1. The properties of the foamed product are set forth in Table 1 below.

Table 1

No.	pH during gelation	Bulk density (g/cm ³)	Color	Foamed product		
				Abrasion hardness (wt.%)	Alkali resistance (wt.%)	Compressive strength (kg/cm ² .mm)
Ex. 1						
1 - a	1.9	0.29	Green	99.1	87.1	2.9
1 - b	6.0	0.26	do.	97.2	82.3	2.7
Comp. 1	8.5	1.12	do.	99.5	10.6	5.4
Comp. 2	3.0	0.23	White	54.5	68.4	2.2

EXAMPLE 2

Alumina powder having a particle size shown in

The properties of the foamed products are shown in Table 3 below. Sample No. 16 was prepared without using a powder.

Table 2 below was mixed with and uniformly dispersed in the silica sol of Comparison Example 2 above in an amount of 5% by weight, based on the weight of SiO₂ in the sol, and the resulting sol was left for 12 hours for gelation. The gel obtained was washed with water, then dried at 50°C and thereafter pre-fired at 650° to 700°C for 1 hour and 30 minutes in a tunnel kiln, followed by further firing at 1300°C for 8 minutes in a rotary kiln to obtain a foamed product. The properties of the products are given in Table 2 below. For comparison, Table 2 below also shows the results obtained by using an alumina powder having particles sizes in excess of 100 μ.

Table 2

No.	Particle size of Al ₂ O ₃ (μ)	Foamed product			Compressive strength (kg/cm ² .mm) (wt.%)
		Bulk density (g/cm ³)	Abrasion hardness (wt.%)	Alkali resistance	
1	20 - 50	0.40	98.3	90.4	4.9
2	1 - 10	0.36	99.1	93.2	5.4
3	0.05 - 1	0.35	97.7	95.6	5.3
4	120 - 150	0.25	53.2	69.0	2.3

EXAMPLE 3

Various powders having particle sizes of 0.4 to 20 μ were added to the silica sol of Comparison Example 2 above in an amount of 5% by weight, based on the weight of SiO₂ in the sol. In the same manner as in Example 1, each of the sols thus obtained was gelled, washed with water and dried to prepare a silica gel containing about 0.6% by weight of a water-soluble component (Glauber's salt), which was fired at 1350°C for 10 minutes in a rotary kiln to obtain a foamed product.

Table 3

No	Powder used	Foamed product				
		Bulk density (g/cm ³)	Color	Abrasion hardness (wt.%)	Alkali resistance (wt.%)	Compressive strength (kg/cm ² .mm)
1	Titanium dioxide	0.32	White	75.4	96.4	3.2
2	Zirconia	0.39	White	76.3	98.1	3.4
3	Manganese oxide	0.38	Light red	74.9	97.4	2.9
4	Zinc oxide	0.30	White	70.4	92.1	3.7
5	Tin oxide	0.37	White	71.2	98.4	4.2
6	Iron oxide	0.35	Red	74.7	96.0	4.7
7	Pottery stone	0.31	White	71.4	93.6	2.7
8	Kaolin	0.29	White	70.2	94.8	2.9
9	Aluminous shale	0.40	White	75.0	98.4	3.5