tetrahydrosilane (SiH_4) and dihydrosilylene (SiH_2). It is also thought that this produced dihydrosilylene undergoes polymerization as shown in reaction equation (iii) below to form a solid polysilane (Si_nH_{2n}) and that this polysilane adsorbs to the surface of the zeolite and the dehydrogenative coupling activity of the hydrosilane is then lowered and as a consequence the yield of oligosilane, including disilane, is lowered.

When, on the other hand, hydrogen gas is present, it is thought that ~~the dihydrosilylene undergoes decomposition to~~ tetrahydrosilane is produced from the dihydrosilylene as shown in reaction equation (iv) below and that the production of polysilane is then suppressed and as a consequence oligosilane can be produced on a long-term and stable basis.

$$2SiH_4 \rightarrow Si_2H_6 + H_2 \qquad \text{(i)}$$

$$Si_2H_6 \rightarrow SiH_4 + SiH_2 \qquad \text{(ii)}$$

$$nSiH_2 \rightarrow Si_nH_{2n} \qquad \text{(iii)}$$

$$SiH_2 + H_2 \rightarrow SiH_4 \qquad \text{(iv)}$$

The reactor is preferably free of moisture to the greatest extent possible. For example, the zeolite and reactor are preferably thoroughly dried prior to the reaction.

[0019] The reaction pressure, considered as the absolute pressure, is generally at least 0.1 MPa and is preferably at least 0.15 MPa and more preferably at least 0.2 MPa, and is generally not more than 1,000 MPa and is preferably not more

was brought to 1 mL/minute and the helium gas was brought to 20 mL/minute and the temperature within the reaction tube was ~~varied~~ set as shown in Table 19. The composition of the reaction gas was analyzed by gas chromatography after each time period had elapsed and the silane conversion, disilane yield, and selectivity for disilane were calculated. The results are given in Table 19.

[0071]

[Table 19]

Table 19

temperature in the reaction tube [°C]	elapsed time [h]	silane conversion [%]	disilane yield [%]	selectivity for disilane [%]
300	1	37	0.8	2
300	2	12	1.1	9
300	3	6.5	1.8	27

[0072] <Example 14>

1.0 g of the 1% Pt-loaded ZSM-22 prepared in Preparative Example 12 was placed in the reaction tube and the air was removed from the reaction tube using a vacuum pump and substitution with helium gas was then carried out. The helium gas was passed through at a rate of 40 mL/minute and the temperature was raised to 200°C, after which the helium gas was passed through for 1 hour. Then, an argon/silane mixed gas (Ar : 20%, SiH_4 : 80% (volume ratio)) at 8 mL/minute and helium gas at 40 mL/minute were mixed in a gas mixer and passed through. After 5 minutes, the argon/silane mixed gas