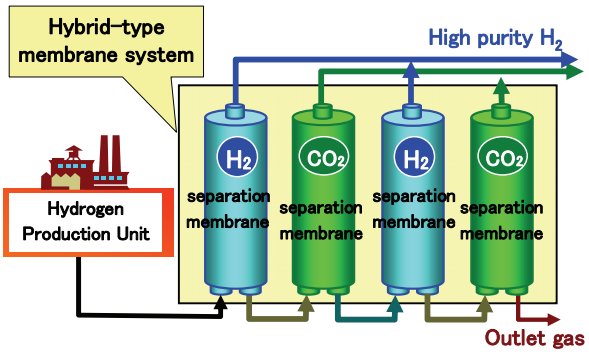

Fig.1 Image of hybrid-type membrane system.

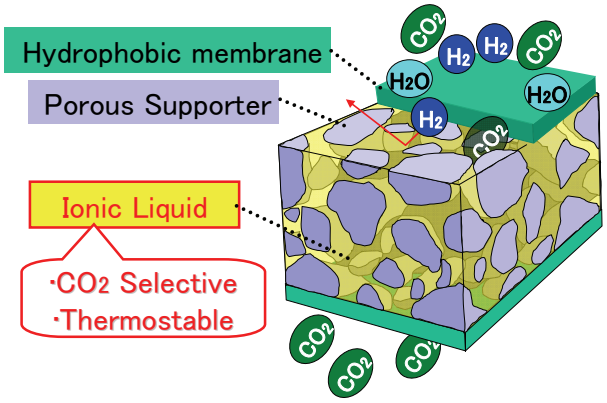

Fig.2 Supported ionic liquid membrane for CO_2/H_2

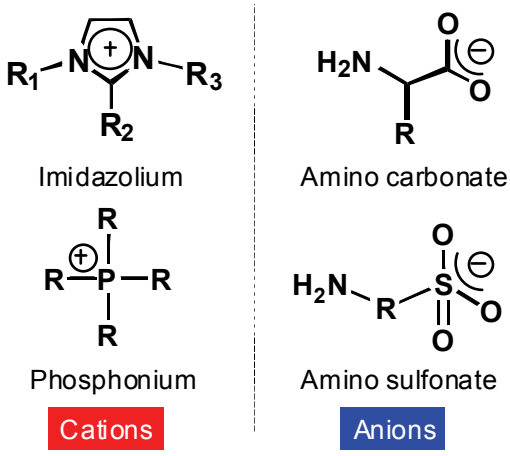

Fig.3 Examples of our synthesized "CO_2-phillic" ionic

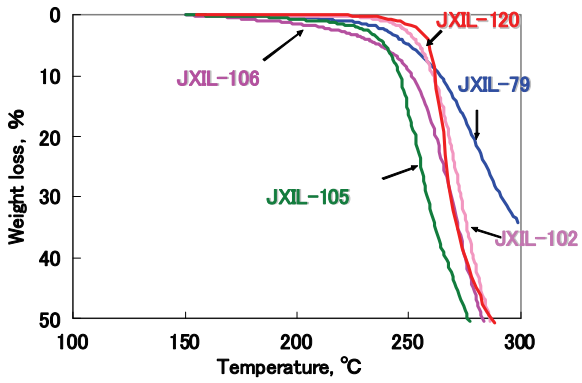

Fig.4 Thermostability of the ionic liquids consisting of the same kind of amino carbonate.

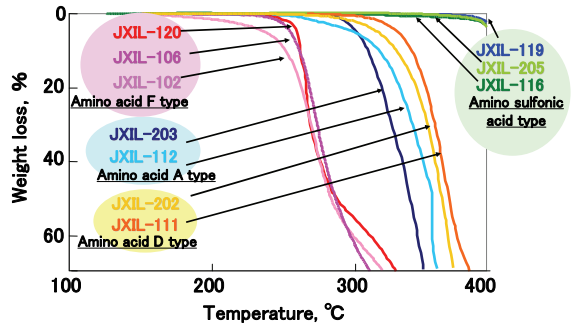

Fig.5 Thermostability of the ionic liquids consisting of phosphonium cations.

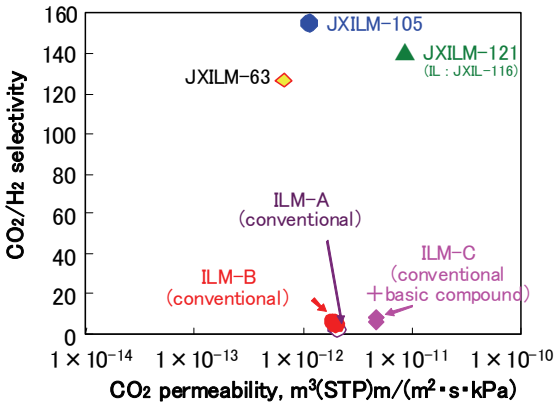

Fig.6 Gas Separation ability of our synthesized facilitated transport membranes.

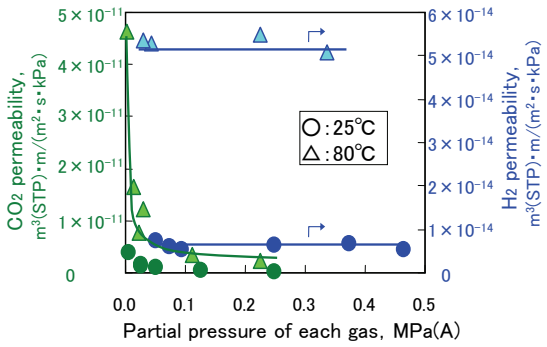

Fig.7　Relationship between partial pressure of each gas and gas permeability measured in JXILM-105.

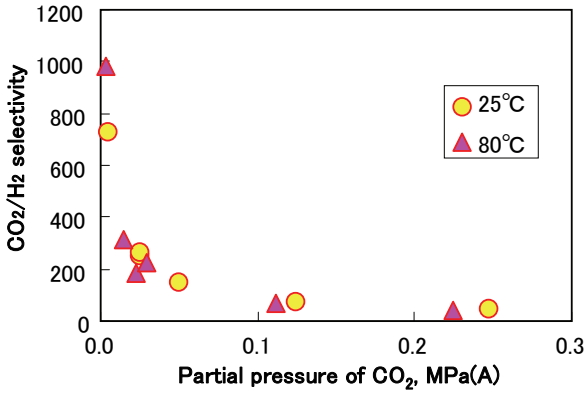

Fig.8　Relationship between partial pressure of CO_2 and CO_2/H_2 selectivity measured in JXILM-105.

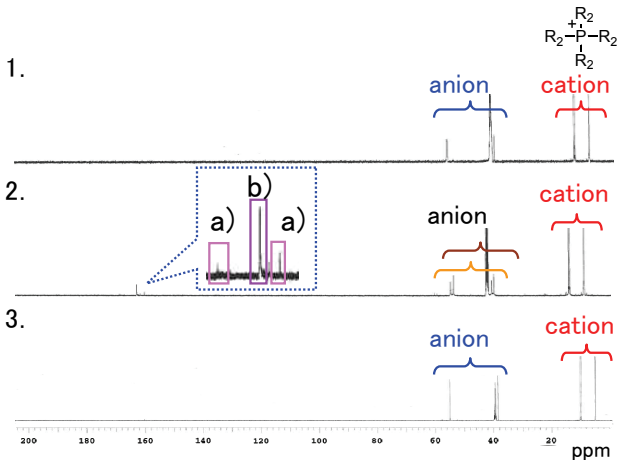

Fig.9 CO_2 absorption experiments; 1)before CO_2 treatment, 2) CO_2 treatment, 3) after heating at 100°C.

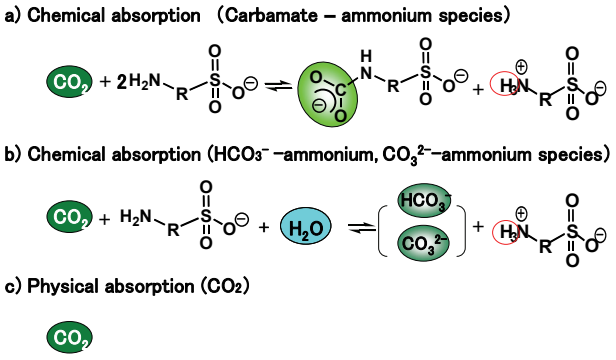

Fig.10 Estimated CO_2 permeation mechanism.

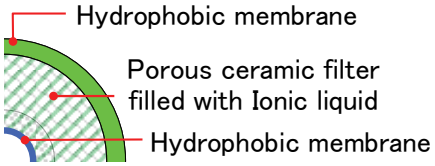

Fig.11 Layer structure of the tubular type membrane.

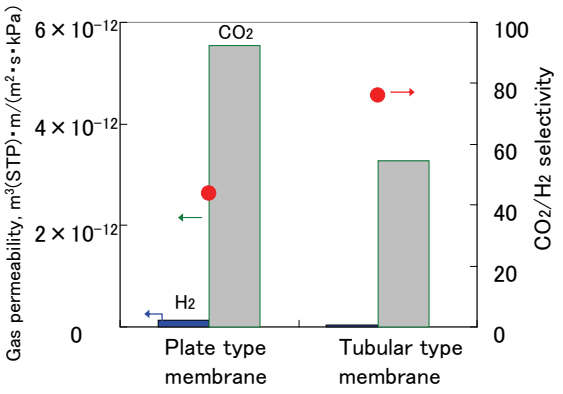

Fig.12 Modularization of the membrane.

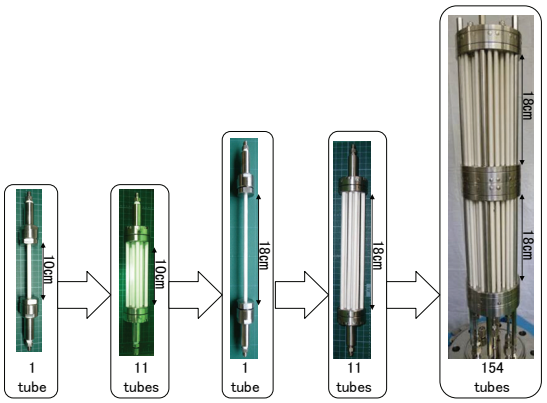

Fig.13 Scale-up of the membrane modules.

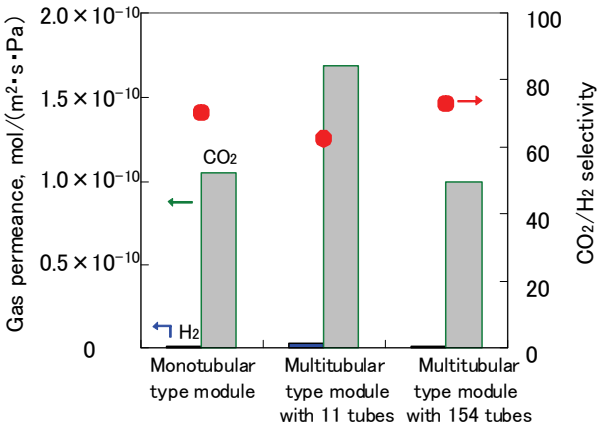

Fig.14 Gas separation ability of membrane modules in different sizes.

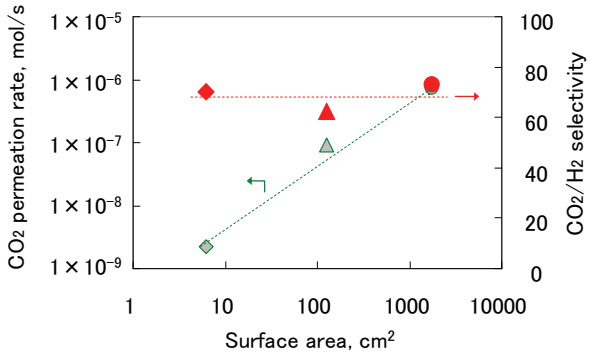

Fig.15 Gas separation ability of membrane modules in different sizes.

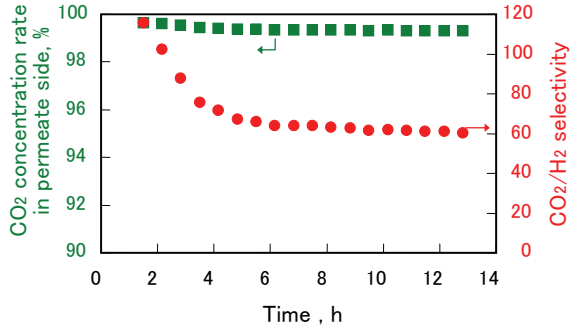

Fig.16 Stability of the CO_2 selectivity.

(Feed gas: H_2:CO_2=30:70,　80°Cwet)

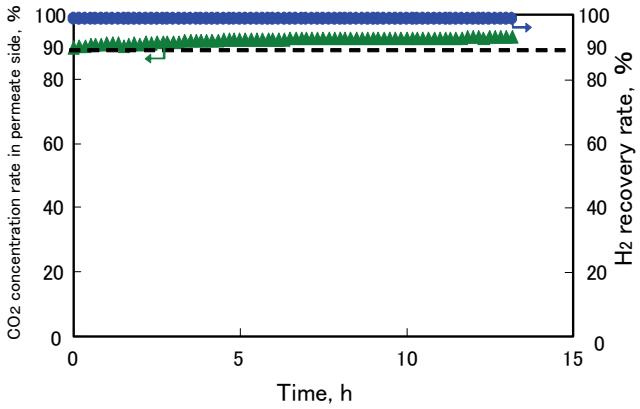

Fig.17 Gas separation figure of H_2 purification system with　hybrid-type membranes.

(Feed gas; H_2:CO:CH_4:CO_2=70:5:5:20, wet, 2MPa G)