NEW S = 1/2 ALTERNATING CHAIN COMPOUND HIGH PRESSURE FORM OF $(VO)_2P_2O_7$

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$(VO)_2P_2O_7$, known as a quantum spin chain compound, was found to undergo a structural transition when treated at 2 GPa and 700 °C. The high-pressure phase as studied by powder X-ray and neutron diffractions comprises a unique kind of $S = 1/2$ Heisenberg alternating antiferromagnetic chain, in contrast with the ambient pressure phase containing two crystallographically different chains. The magnetic susceptibility and the high-field magnetization data consistently showed the presence of a spin gap of about 26 K as expected from the structure. Single crystal sample was also obtained by slow cooling the melt at 3 GPa.

9.7 cm

13.4 cm

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