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High Pressure ^{31}P -NMR Study of the 2D Frustrated Square-Lattice Compound $\text{BaCdVO}(\text{PO}_4)_2$ at Low Temperatures¹ B. ROY, Ames Laboratory, Dept. of Phys. and Astro., Iowa State Univ., Y. KOMAKI, Graduate School of Science, Dept. of Phys., Chiba Univ., R. NATH, D.C. JOHNSTON, Y. FURUKAWA, Ames Laboratory, Dept. of Phys. and Astro., Iowa State Univ. — $\text{BaCdVO}(\text{PO}_4)_2$ is a $S=1/2$ frustrated square-lattice (FSL) compound with a nearest neighbor exchange coupling $J_1 \sim -3.36$ K and a next-nearest neighbor exchange coupling $J_2 \sim 3.53$ K bearing $J_2/J_1 \sim 1.05$. Based on the J_2/J_1 ratio, the system is known to be located close to the disordered ground state (known as ‘nematic state’) regime of the phase diagram. We have carried out ^{31}P -NMR measurements under high pressure (~ 1 GPa) and at low temperatures using dilution refrigerator to investigate the pressure effects on the magnetic properties of the system. Under ambient pressure at $H=2.67$ T, we observed a sharp peak in ^{31}P spin lattice relaxation rate ($1/T_1$) at $T_N \sim 1.05$ K, which corresponds to the antiferromagnetic ordering temperature. On the other hand, under a pressure of 1 GPa, the peak in $1/T_1$ is suppressed and $1/T_1$ shows a sudden decrease below ~ 0.75 K. This indicates that T_N decreases with the application of pressure. We will report the temperature dependence of the NMR spectra and of the $1/T_1$ under different magnetic fields and pressures.

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