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Magnetic structures and proton dynamics in phosphatic oxyhydroxides

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Geometrically frustrated spin systems comprised of e.g. zig-zag chains, triangles, or pentamers of MO6 (M = 3d-metal cations) often show magnetoelectric (ME) coupling effects fundamental in multiferroics. Many phosphatic oxyhydroxides exhibit such interesting moieties of MO6. Besides, they contain hydrogen networks of OH- and HOH-groups, showing various strengths of hydrogen bonds, such as (Mn2+,Fe2+)AlPO4(OH)2H2O, (Fe2+,Mn2+,Zn)(Fe3+)4(PO4)3(OH)5, and (Mn2+,Fe2+)(PO4)2(PO3OH)2(H2O)4. Uing elastic/quasielastic scattering studies, their complicate antiferromagnetic structures could be elucidated along with proton tunnelling and super protonic conductivity [1, 2, 3]. These interesting properties and further new findings will be presented at SNI 2018.

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2. Röska, S.-H. Park, Y. Yoshimori, K. Kimura, T. Kimura, Anomalous dielectric response of short hydrogen bonds under pressure: The case of (Mn,Fe)2+AlPO4(OH)2H2O, JPCM 29 (2017) 365401(5pp).
3. D. Behal, B. Röska, S.-H. Park, B. Pedersen, G. Benka, Ch. Pfleiderer, Y. Wakabayashi, T. Kimura, The first study of antiferromagnetic eosphorite-childrenite series (Mn1-xFex)AlPO4(OH)2H2O (x = 0.5), J. Magn.& Magn. Mater. 428 (2017) 17-27.

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