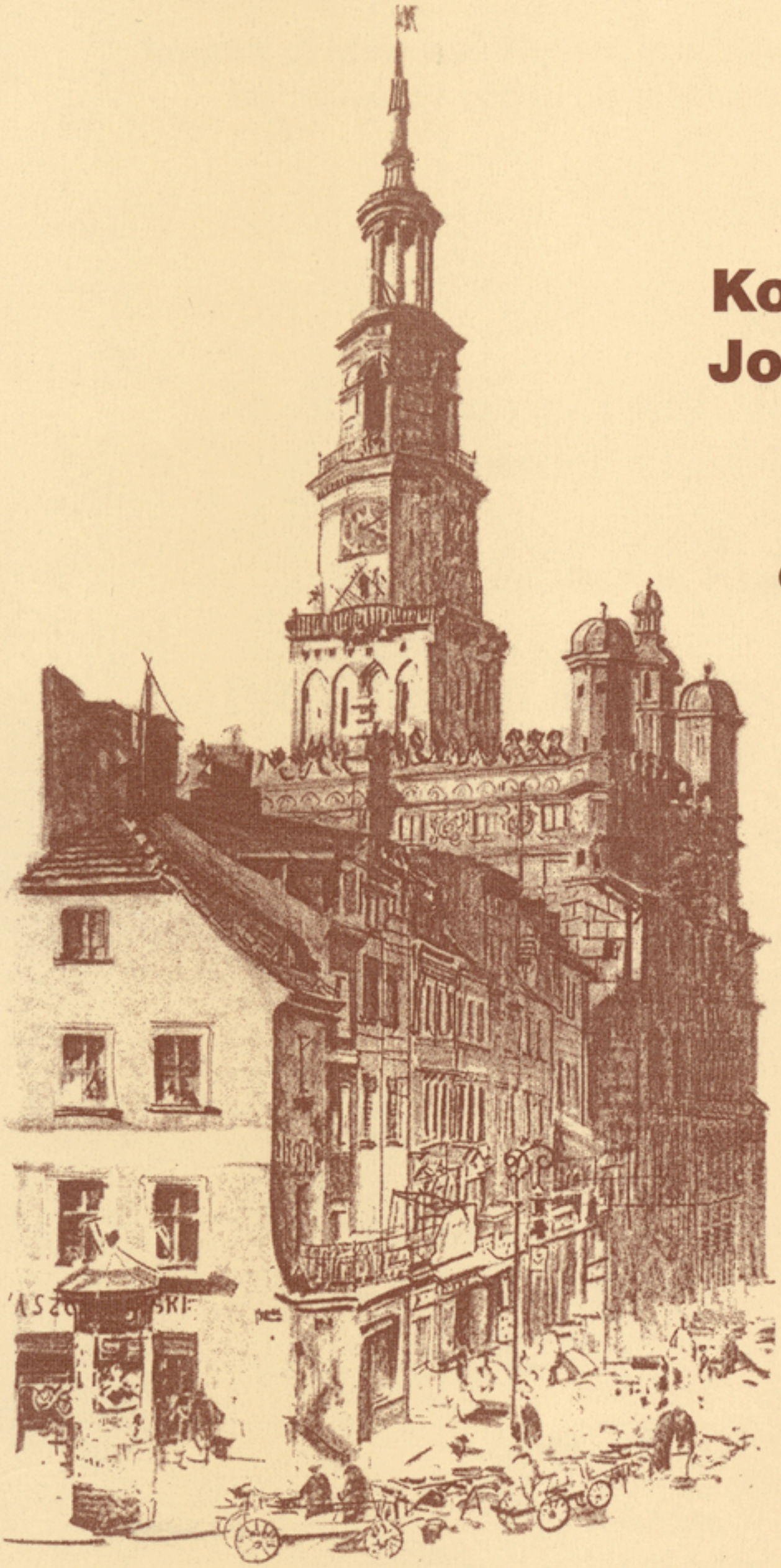

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MAGNETIC PROPERTIES OF $R_1Y_2Fe_5O_{12}$ (R=Pr, Nd, and Gd) DERIVED BY SOL-GEL METHOD

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Fine particles of $R_1Y_2Fe_5O_{12}$ (R = Pr, Nd, and Gd) were prepared by a new salts-routed sol-gel process, and their magnetic properties were investigated by using x-ray diffraction(XRD), atomic force microscopy(AFM), vibrating sample magnetometer(VSM), and Mössbauer spectroscopy. The stock solutions were dissolved in absolute 2-Methoxyethanol(2-MOE). Heat treatments were carried out at 600-800 ℃ for the thin films for 1h in air, and at 800 – 1000 ℃ for powders for 6 h in air. Nano-sized fine particles were dispersed on SiO_2/Si(100) The microstructure of the films consisted of spherical grains of 500-1000 Å in size and 60-150 Å in surface roughness(rms). The films annealed at other temperatures exhibited almost the same trend, only differing in coercivity(H_C) and saturated magnetization (M_S) values. The largest coercivity in thin films is 64 Oe for $Pr_1Y_2Fe_5O_{12}$. The H_C increase as doping ionic radius increases from Gd to Pr. Mossbauer spectra for $R_1Y_2Fe_5O_{12}$(R = Pr, Nd, and Gd) composed with 2set of 6-Lorentzians for iron.

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