The effects of Ga substitution on the Co-site on the high-temperature thermoelectric properties and microstructure are investigated for the misfitlayered Ca3Co4O9 and the complex perovskite-related Sr3RECo4O10.5 (RE = rare earth) cobalt-based oxides. For both systems, substitution of Ga for Co results in a simultaneous increase in the Seebeck coefficient (S) and the electrical conductivity (\( \sigma \)), and the influence is more significant in the high temperature region. The power factor (S \( \text{\textsuperscript{2}} \) \( \sigma \)) is thereby remarkably improved by Ga substitution, particularly at high temperatures. Texture factor calculations using x-ray diffraction pattern data for pressed and powder samples reveal that the Ga-doped samples are highly textured. Microstructure observed by scanning electron microscopy shows very well-crystallized grains for the samples with Ga substitution for Co. Among the Ga-doped samples, Ca3Co3.95Ga0.05O9 shows the best ZT value of 0.45 at 1200 K, which is about 87.5% higher than the nondoped one, a considerable improvement.