Acoustic emission (AE) during the tensile testing of zirconium alloys at room temperature starts near the proportional limit, reaches a maximum rate near the maximum in the apparent work hardening curve, stops near the peak load and is silent from there to fracture. Annealing to increase the grain size results in an increase in count rate of $>10^4$ for crystal-bar zirconium, but only about a factor of 10-30 for Zircaloy-2 and Zr-Cr-Fe. This is thought to be a measure of the increase in the frequency of twinning resulting from increased grain size. An increase in twinning resulting from cooling to 77 K could not be detected because of counter saturation by the noise of liquid nitrogen boiling. AE continues at a decreasing rate during stress relaxation, showing that dislocation generation is also continuing. Pre-oxidation of specimens results in little change in AE.