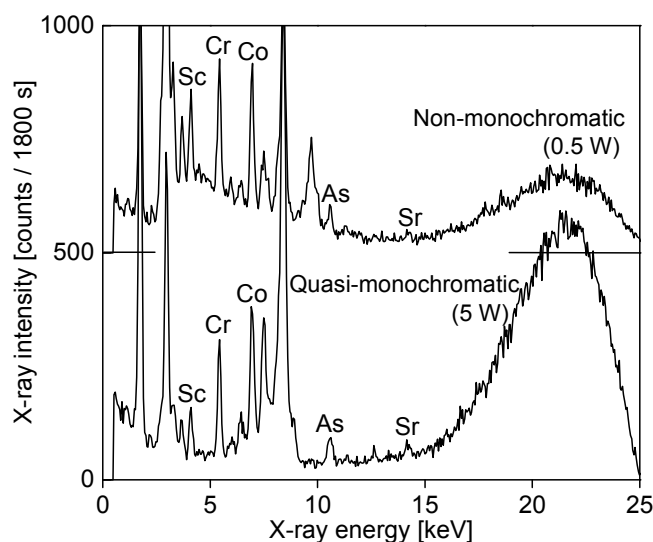


## Using non-monochromatic X-rays is more effective for highly sensitive analysis in the TXRF analysis

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Monochromatic X-rays are usually used for highly sensitive analysis in the TXRF analysis. However, here we report that using non-monochromatic X-rays is more effective for trace elemental analysis. As shown in Figure 1, sub-nanograms of each element are detected using non-monochromatic X-rays from a 0.5 W X-ray tube as well as quasi-monochromatic X-rays from a 5 W X-ray tube. Detection limits obtained by the non-monochromatic X-rays are similar to those obtained by the quasi-monochromatic X-rays. For example, the detection limit for Co is 40 pg. This result shows that highly sensitive analysis is performed using non-monochromatic X-rays even when a lower power X-ray tube is used.



**Fig.1.** TXRF spectra of 500 pg each of Sc, Cr, Co, As, and Sr measured using non-monochromatic X-rays from a 0.5 W X-ray tube (25 kV and 20  $\mu$ A) and quasi-monochromatic X-rays from a 5 W X-ray tube (25 kV and 200  $\mu$ A). A 40  $\mu$ m thick Cu filter is used as a monochromator.