A method to determine the amount of poly(ethylene glycol) byproducts in fatty alcohol ethoxylates (FAE) has been developed. Fatty alcohol ethoxylates are important nonionic surfactants used in personal care products, household detergents, and pharmaceuticals. In the synthesis of FAEs, hydroxyl terminated polyethylene glycol (PEG) can be formed as a byproduct that subsequently affects the surfactant’s performance. The quantification of PEG byproducts in fatty alcohol ethoxylates is difficult to accomplish using size exclusion chromatography because both components have similar molecular weights. In addition, it is desirable to quantitate FAEs of individual chain lengths. Gradient HPLC can be used to achieve these separation goals. However, the use of a gradient necessitates the use of an evaporative light scattering detector (ELSD). Since the ELSD has a different response factor for each oligomer of PEG, quantification is only possible when there are standards for each oligomer so that individual calibration curves can be established. This study establishes a method to accurately quantify the amount of hydroxyl terminated PEG using liquid adsorption and/or liquid exclusion-adsorption chromatography with dRI detection at isocratic mode of elution. The effectiveness of the method is demonstrated by applying it to industrial nonionic surfactant products.