The process of photography can be divided into three primary components: capture, storage, and output. Whether the component being utilized is based on traditional silver halide technology, the continuously evolving digital technology, or a combination of both, materials science plays a vital role in the development of photographic systems. In traditional silver halide based photography, over 100 individual components including photoactive materials, antistatic phases, polymers, organic dyes and couplers, cellulosics, gelatin, inorganics, developers, acids, bases, etc. are necessary to develop the prints people hold in their hands. Though digital imaging does not require as many components, the materials involved are as diverse as in silver halide systems and in some cases, are more complex to process. Continued growth in these methods of image generation requires the development of new materials and new processes. Essential to the efficient development of these materials and processes, are characterization techniques that allow for the understanding of existing and novel systems. X-ray diffraction plays a vital role in the analysis of many of the materials utilized in the photographic industry. Several examples will be presented that demonstrate the use of XRD for evaluation of current and future photographic materials.