1056-05-1275 **Thomas Langley*** (langley@rose-hulman.edu), Rose-Hulman Institute of Technology, Department of Mathematics, CM144, 5500 Wabash Ave., Terre Haute, IN 47803, and **Jeffrey Liese** (jliese@calpoly.edu) and **Jeffrey Remmel** (remmel@math.ucsd.edu). *Wilf equivalence for generalized factor order modulo k.*

Kitaev, Liese, Remmel and Sagan recently defined generalized factor order on words with letters from a poset $(P, \leq_P)$ by setting $u \leq_P w$ if there is an embedding of u into w. If P is the positive integers with the usual ordering, they defined the weight of a word $u = u_1 \dots u_n$ to be $\mathrm{wt}(u) = x^{\sum_{i=1}^n u_i} t^n$ and introduced the weight generating function $F(u;t,x) = \sum_{w \geq_P u} \mathrm{wt}(w)$. They defined two words u and v to be Wilf equivalent if and only if $F(u;t,x) = F(v;t,x)$, and provided combinatorial proofs of many Wilf equivalences. We continue this study by giving an explicit formula for a related generating function in the event that u has a certain factorization, allowing us to classify Wilf equivalence for all words of length 3. We then extend Kitaev, Liese, Remmel and Sagan's ideas to the poset $\mathcal{P}_k$, defined as the positive integers with the ordering $i <_k j$ if $i < j$ and $i \equiv j \mod k$ for $k \geq 2$, providing many analogues of their results in this new setting. We also give an analogue of our generating function formula, valid for a rich class of words, and classify Wilf equivalence for permutations of n with $n \leq 2k$, and for all words of length 3 in this context. (Received September 21, 2009)