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A mixed hypergraph is a triple $\mathcal{H} = (V, \mathcal{E}, \mathcal{C})$, where V is a set of vertices, and \mathcal{E}, \mathcal{C} are families of subsets of V called *edges* and *co-edges*, respectively. A vertex coloring of \mathcal{H} is *proper* if (1) each edge has at least two vertices of different colors and (2) each co-edge has at least two vertices of the same color. \mathcal{H} is *uncolorable* if it has no proper coloring.

We say that a vertex coloring is *rainbow-free* if it satisfies property (2). The *upper chromatic number* of the hypergraph of co-edges $\mathcal{H}_C = (\mathcal{H}, \mathcal{C})$ is the maximum number of colors for which there is a rainbow-free coloring.

We study these concepts for random mixed hypergraphs: Let $k, \ell \geq 2$ be fixed integers, and let $p, q : \mathbb{N} \rightarrow [0, 1]$ be functions. Define \mathcal{H} by letting each k -subset of V be an edge with probability p , and letting each ℓ -subset of V be a co-edge with probability q . The primary question is: for what p, q is \mathcal{H} uncolorable? (Received January 09, 2007)