Zbl 316.05111
Erdős, Paul; Simonovits, M.; Sos, V.T.
Anti-Ramsey theorems. (In English)
Infinite finite Sets, Colloq. Honour Paul Erdős, Keszthely 1973, Colloq. Math. Soc. Janos Bolyai 10, 633-643 (1975).

[For the entire collection see Zbl 293.00009.]
Let H be a fixed graph: $f(n;H)$ denotes the maximum number so that any edge coloring of K^n, the complete graph on n vertices, which uses $f(n;H)$ or more distinct colors yields a subgraph isomorphic with H each edge of which has a different color (a totally multicolored subgraph). The paper contains a reformulation of some earlier results, some new results, and some conjectures, all concerning the function $f(n,H)$. For example: Theorem 4 (a new result): Let $p \geq 4$. There exists an n_p such that if $n > n_p$, then $f(n,K^p) = \text{ext}(n,K^{p-1})+1$, (where $\text{ext}(n,K^{p-1})$ is the maximum number of edges a graph on n vertices can contain without containing K^{p-1} as a subgraph). Further if K^n is colored by $f(n,K^p)$ colors and contains no totally multicolored K^p, then its coloring is uniquely determined: one can divide the vertices of K^n into d classes $A_1,\dots,A_d$ so that each edge joining vertices from different A_i's has its own color (that is, a color used only once) and each edge (x,y) where x and y belong to the same A_i has the same color independent from x, y and i. Conjecture 1. Let C^k denote the k-circuit. Then $f(n,C^k) - n((k-2)/2 + 1/(k-1)) + 0(1)$.

J.E.Graver

Classification:
05C15 Chromatic theory of graphs and maps
05C35 Extremal problems (graph theory)