stood the solvents used in the concentrations and times required by the CVC procedures.

Although Table 1 lists numbers of particles and ratios of increase realized for certain viruses, it can be seen from the same table that these are not constants. As was the case for CpMV (ratios of 40:1, 55:1, and 33:1), SYNV (ratios of 18:1 and 39:1), TMV (ratios of 71:1 and 27:1), TNV (ratios of 81:1 and 67:1), and TRSV (ratios of 58:1 and 114:1), numbers can vary from one experiment to another even when the same hosts and CVC variation are used.

Thus, the numbers listed in Table 1 are suggestive rather than predictive of virion enhancement, especially in the case of the average ratio given for the sum of the experiments done here (ratio = 35:1). Rather, the conclusion to be drawn from Table 1 is that the CVC procedures can often result in a considerable increase in actual and apparent virus concentration. It was also our observation that the clarified samples from the CVC preparations allowed micrographs to be produced that were superior in the sharpness of delineation and reduction of background clutter to those produced from crude extracts.

Viruses have often been purified on a small scale by density gradient centrifugation, and TMV has been purified in small amounts using PEG (2). Our effort has been directed to producing small quantities of semipurified virus suitable for use in detecting virions by electron microscopy. We have endeavored to keep the procedure fast and simple so that multiple samples from disparate virus groups may be processed readily.

It should be mentioned that the CVC procedures may prove to be valuable in areas of virus research other than electron microscopy. Koenig observed that sap components interfered with virion adsorption when crude saps were used with the indirect enzyme-linked immunosorbent assay (ELISA) (16). CVC methods might therefore be useful to expedite indirect ELISA, as the CVC systems that use clarifying solvents tend to reduce the sap constituents that compete for adsorption sites with virions.

CVC procedures may be valuable as pilot programs to develop full-scale virus purification procedures and should abbreviate the time and diminish the quantity of materials normally required for such pilot studies. Because CVC techniques expedite the processing of multiple samples, the CVC protocols can be varied to test various buffers, solvent systems, etc. The results may be compared directly for yields and degrees of clarification. In fact, the CVC procedure has been used successfully to devise a purification regimen for pepper mild mosaic virus (E. Debrot, personal communication). After upscaling a successful CVC technique to produce larger quantities of