INTRODUCTION

Ethylene Copolymer Resin (ECR) modifiers, designed to be soluble in all proportions in PVC, form a wide variety of plasticized PVC blends. These solid, high molecular weight (Mw >250,000) resin modifiers, unlike conventional liquid plasticizers, do not migrate in PVC. Homogeneous blends of ECR and PVC are true polymer alloys that exhibit:

• Low extraction in soapy water, hexane and mineral oil
• Low volatility, migration and spew
• Outstanding low temperature impact resistance
• Excellent resistance to microbiological attack.

In order to take full advantage of these beneficial properties, it is essential that the PVC/ECR blends are made homogeneous through effective melt compounding.

Conventional liquid plasticizer is completely absorbed by the PVC powder, in the dry-blending step, prior to melt compounding. With the solid ECR pellets this cannot occur. A salt and pepper blend of pellets in PVC powder, therefore, is prepared prior to compounding.

During the melt compounding step, the low melting ECR (m.p. 66°C) melts first forming a relatively low viscosity phase in which the higher melting (m.p. >170°C) and more viscous PVC #"Elvaloy" resin modifiers.
Fig. 1. Unfluxed PVC gel particle in heterogeneous blend. (a) scanning electron micrograph showing 0.12 mm gel particle (magnified 200 times). (b) energy dispersive X-ray scan showing higher Cl content, in the same gel particle, relative to the surrounding matrix.